REPORT, RETURNS AND STATISTICS

OF THE

INLAND REVENUES

OF THE

DOMINION OF CANADA

FOR THE FISCAL YEAR ENDED JUNE 30

1904

PART III

ADULTERATION OF FOOD

PRINTED BY ORDER OF PARLIAMENT

OTTAWA :
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1905

No. 14—1905.]

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REPORT

OF THE

DEPUTY MINISTER OF INLAND REVENUE.

INSPECTION OF FOODS, DRUGS AND FERTILIZERS.

To the Honourable L. P. Brodeur,
Minister of Inland Revenue.

Sir,—I have the honour to submit herewith the reports of the official analysts of the Dominion for the fiscal year ended June 30, 1904.

The following is a summary statement of the whole number of samples analysed, and results reported, by them :—

Description of Samples.	Genuine.	Doubtful.	Adulterated.	Total.
Milk	76	15	17	108
Fertilizers as sold	59	29	8	96
Maple sugar	1	0	3	4
Maple Syrup	2	0	3	5
Total	138	44	31	213

The following is a summary of the number of collected samples analysed by the Chief Analyst and his staff at the Inland Revenue Laboratory in Ottawa :—

Description of Samples.	Genuine.	Doubtful.	Adulterated.	Total.
Flavouring extracts	3	61 (1)	24 (1)	88
Honey	81	5	13 (2)	99
White lead in oil	100	35 (3)	12 (3)	147
Distilled liquors	109	107 (4)	0	216
Milk	87	19	10	116
Cider	27	0	14 (5)	41
Ground spices	88	7	93	188
Jams and jellies	14	5	55 (6)	74
Wheaten flour	75	0	0	75
Tea	73	0	0	73
Coffee	45	11	19 (7)	75
Milk not described in Bulletin 93	10	1	1	12
Total	712	251	241	1,204

(1) Artificially colored, or flavour not genuine.
(2) Adulterated with cane sugar or glucose.
(3) Indicated as 'adulterated' or 'doubtful' but not sold as 'pure' and therefore not contrary to the provisions of the Act.
(4) Diluted with water and pronounced doubtful as compared with standards established by the British 'Sale of Food Amendment Act.'
(5) Contained small quantities of Salicylic Acid.
(6) The presence of foreign fruit or glucose deemed to constitute adulteration.
(7) Of these three were sold as mixtures.

The following statement shows the total number of samples examined during the fiscal year ended June 30, 1901, 1902, 1903 and 1904 respectively :—

	During the Fiscal Year ended June 30.			
	1901.	1902.	1903.	1904.
1. Number of samples collected by the food inspectors for examination	885	883	541	1,417
2. Number of these samples examined by the public analysts.	881	883	163	213
3. Number of these samples examined in the laboratory here.	243	270	425	1,341
4. Number of samples examined at the laboratory here, duplicates of which were not analysed by the public analysts	802	600	1,017	1,808
This number however includes the following :—				
Samples of beer	25	32	70	15
" vinegar	413	346	366	239
Standard fertilizers	102	106	128	111
Sundry others	.....	.....	.....	83
Samples examined for other departments :—				
Marine and Fisheries	3	15	8	1
Public Works	0	3	0	0
Militia and Defence	0	3	16	5
Indian Affairs	0	6	2	2
Agriculture	0	15	3	0
Police Branches	1	1	0	1
Interior	0	2	0	3
Trade and Commerce	2	0	0	0
Railways and Canals	0	0	97	7
Customs	0	0	4	0

The Chief Analyst in his report refers to the desirability of establishing, at an early date, standards of purity for food.

This subject is one that has been under consideration by the Department for several years past, but in view of the fact that very few of the older nations have yet seen their way, except in respect of a very limited number of articles, to establish such standards it is felt that the information at our service is not yet sufficiently complete to enable Canada to take definite action in a matter of such great importance.

In England, no legal standard for food, with the single exception of milk, exists. In France, Germany and other European countries standards for certain specific articles have been fixed, but the matter, as a whole, is still under consideration, while in the United States a serious effort is being made to secure data to enable standards to be determined and legalized. In some specific cases standards have been so legalized and marked progress is being made towards extending the list to embrace a greater number of articles. This Department is watching the procedure of the outside world and will not fail to make use of all experience gained.

I have the honour to be, sir,

Your obedient servant,

W. J. GERALD,

Deputy Minister.

INLAND REVENUE DEPARTMENT,
OTTAWA, January 3, 1905.

REPORT OF CHIEF ANALYST.

317 Queen Street,
Ottawa, December 3, 1904.

W. J. Gerald, Esq.,
Deputy Minister of Inland Revenue,

Sir,—I beg to submit the following report for the year ended June 30, 1904, regarding the work of this branch.

The following statement, made out as you have instructed, gives the number of food and other samples examined during the year :—

1. Number of samples collected by the food inspectors for examination	1,417
2. Number of these examined by the district analysts	213
3. Number of these examined in the Inland Revenue Laboratory at Ottawa (1204 + 137)	1,341
4. Number of sample analysed in the Inland Revenue Laboratory, duplicates of which were not examined by the district analysts	1,808

The last mentioned number, however, includes the following :—		
Standard fertilizers		111
Inland Revenue samples :—		
Beer	15	
Vinegar	239	
Sundry others	83	
		337
Samples examined for the following Departments :—		
Marine and Fisheries	1	
Railways and Canals	7	
Militia and Defence	5	
Indian Affairs	2	
Interior	3	
North-west Mounted Police	1	
		19
		467

I beg to call your attention to the very considerable progress which has recently been made in the United States in establishing legal standards of purity for food, much of which is recorded in Circular No. 10, from the office of the Secretary of the United States Department of Agriculture. These standards are similar in many cases to those proposed by me at various times, and recapitulated in my report of January 2, 1901. From a passage in the above mentioned circular it appears that 'before the adoption of 'any schedule, it was submitted to the manufacturing firms and the trade immediately 'interested for criticism, and when requested by them, conferences for discussion have 'been arranged.' I would respectfully recommend the adoption of this course with the manufacturers and wholesale merchants of Canada, not only with reference to establishing standards for pure articles of food, but also in regard to those which are sold under the Adulteration Act as 'compounds' or 'mixtures.'

I have the honour to be, sir,
Your obedient servant,

THOMAS MACFARLANE,
Chief Analyst.

66 Bedford Row,
Halifax, N.S., December 17, 1904.

The Deputy Minister of Inland Revenue,
Ottawa.

Sir.—I have the honour to submit my annual report on the samples of food &c., received by me for analysis during the year ending June 30, 1904.

—	Genuine.	Doubtful.	Adulterated.	Total.
Milk	16	7	1	24
Fertilizers	18	6	2	26
Total	34	13	3	50

I have the honour to be, sir,
Your obedient servant,
MAYNARD BOWMAN,
Official Analyst.

112 St. François-Xavier Street,
Montreal, November 24, 1904.

The Deputy Minister,
Department of Inland Revenue,
Ottawa.

Dear sir,—I have the honour to submit my report of analyses made during the fiscal year ending June 30, 1904.

I have analysed 65 samples, namely :
24 samples of milk.
32 samples of fertilizer.
5 samples of maple syrup.
4 samples of maple sugar.

The results of my analyses are stated in the following tabular form :

—	Genuine.	Doubtful.	Adulterated.	Total.
Milk	18	4	2	24
Fertilizers	15	14	3	32
Maple sugar	1	0	3	4
" syrup	2	0	3	5
Total	36	18	11	65

The 14 samples of fertilizer were not registered, and therefore, are classed as doubtful. Those marked adulterated did not conform to the requirements of the Fertilizer Act.

In the case of the maple syrups, three samples were largely composed of cane syrup. Cane sugar is also the adulterant present in the adulterated maple sugars.

I have the honour to be, sir,
Your obedient servant,
J. T. DONALD.

WINNIPEG, December 19, 1904.

The Commissioner of Inland Revenue,
Ottawa.

SIR,—I beg to report the results of analyses of samples analyzed during the year ending June 30, 1904,

Milk. 18 samples, 16 genuine and 8 adulterated.

Fertilizers. 10 samples, 5 genuine and 5 doubtful.

Your obedient servant,
EDGAR B. KENRICK.

PUBLIC ANALYST'S OFFICE, VICTORIA, B.C.
December 5, 1904.

To the Commissioner of Inland Revenue,
Ottawa.

SIR,—I beg to submit report for year ending June 30, 1904 :

Samples.	Genuine.	Adulterated	Total.
Milk	16	2 Watered.	18
Fertilizers	8		8
Total	24	2	26

I have the honour to be, sir,
Your obedient servant,
C. J. FAGAN.

SCHOOL OF PRACTICAL SCIENCE,
TORONTO, November 29, 1904.

The Commissioner of Inland Revenue,
Ottawa.

SIR,—I beg to submit the following report of the work done under the Adulteration Act in my laboratory during the year.

In December 1903 I analyzed 24 samples of milk, of which I reported 16 as genuine 4 as adulterated and 4 as doubtful. The samples reported adulterated had all been mixed with water. The doubtful samples were so reported, because they were below the average in respect to total solids.

In April, 1904, I analyzed 20 samples of fertilizers, of which I reported 13 genuine, three as below guarantee and four as not registered according to the Act.

The following is a tabular statement of my work.

—	Genuine.	Adulterated.	Doubtful.	Total.
Milk	16	4	4	24
Fertilizers	13	3	4	20
Total	29	7	8	44

I have the honour to be, sir
Your obedient servant,
W. HODGSON ELLIS.

APPENDIX B.—Inspection of

Date.	Nature of Sample.	Number of Sample.	Name and Address of Vendor.		
				Water.	Ethyl Ether Extract.
1904.			*Official Analyst, Dr. J. T. Donald, Montreal.*	p. c.	p. c.
Apr. 18..	Maple Syrup "Semper Idem" brand, labelled choice Quebec Maple Syrup, Wm. Koch, Montreal.	25301	Imperial Syrup Co., 88 Grey Nun's St., Montreal.	37·73	0·08
" 18..	Maple Syrup "Imperial" brand, labelled Maple Syrup.	25302	" " ..	29·54	0·27
" 18..	Maple Syrup labelled "Beaver" brand, Montreal Maple Co.	25303	" " ..	36·94	0·04
" 18..	Maple Sugar	25304	" " ..	7·70	0·30
" 18..	Maple Sugar, 2nd grade	25305	" " ..	9·63	0·68
" 20..	Maple Syrup	25306	J. L. Jenne, Sutton, P.Q.. ..	31 85	0·10
" 20..	Maple Syrup, guaranteed pure	25307	" " ..	31·72	0·16
" 20..	Maple Sugar	25308	" " ..	10·34	1·04
" 20..	"	25309	" " ..	10·23	0·47

SESSIONAL PAPER No. 14

Maple Syrup and Maple Sugar.

Result of Analysis.						Name of Analyst.	Remarks.
Alcohol Extract.	Residue.	Direct Saccharimeter Reading.	Cane Sugar by Clerget.	Reducing sugar expressed as Glucose.	Total Ash.		
p. c.	p. c.		p. c.	p. c.	p. c.		
61·53	0·55	59·80	60·15	2·29	0·115	Dr. J. T. Donald.	Adulterated, being largely cane syrup.
68·85	1·17	61·80	63·77	4·73	0·181		
62·56	0·38	61·30	61·28	1·30	0·079	"	
91·57	0·43	91·00	90·90	1·87	0·153		Largely composed of cane sugar
86·80	2·06	84·90	85·78	3·60	0·825	"	Genuine maple sugar.
67·06	0·60	65·30	65·50	1·21	0·389		Genuine maple syrup.
66·75	0·94	64·40	65·43	1·00	0·430		
87·35	0·94	87·20	88·04	3·61	0·334		Adulterated by the addition of cane sugar.
87·03	1·45	84·60	86·99	3·60	0·776		"

APPENDIX A. Inspection of Whole Milk.

Date.	Nature of Sample.	Number of Sample.	Name and Address of Vendor.	Name and Address of Furnisher.	Result of Analysis.					Remarks.
					Specific Gravity at 15° C.	Water.	Butter Fat.	Other Solids.	Total Solids.	
1904.			*Official Analyst, Mr. M. Bowman, Halifax.*			p. c.	p. c.	p. c.	p. c.	
Apr. 26	Whole Milk	23839	Thomas R. Duncan, Campbellton, N.B	Vendor	1·032	87·58	3·84	8·58	12·42	Genuine Average milk.
" 26	"	23840	A. F. Chamberlin, Campbellton, N.B	"	1·033	86·81	3 71	9·48	13·19	" "
" 26	"	23841	Robert Nelson, Campbellton, N.B	"	1·0309	86·81	4·68	8·51	13·19	Genuine and rich.
" 26	"	23842	John Mair, Campbellton, N.B.	"	1·0309	86·40	4·53	9·07	13 60	" "
" 26	"	23843	William Pratt, Campbellton, N.B.	"	1·0330	86·92	3·62	9·46	13·08	Genuine average milk.
" 27	"	23844	George Duncan, Campbellton, N.B	"	1·0289	88·92	1·18	6 90	11·08	Under average in total solids and solids not fat, a rich milk or an admixture of milk and cream watered.
" 27	"	23845	Mrs. David Gerard, Campbellton, N.B.	"	1·0299	89·09	2·83	8·08	10 91	Watered.
" 27	"	23846	Mrs. J. H. Gerard, Campbellton, N.B.	"	1·0309	86·69	4·34	8 97	13·31	Genuine and rich.
" 27	"	23847	Charles Coes, Campbellton, N.B.	"	1·0309	85·73	4 97	9 39	14·27	Genuine and very rich
" 27	"	23848	H. R. Murray, I. C. R. Depot, Campbellton, N.B.	Charles Coes, Campbellton, N B.	1·0309	87 00	4·19	8·81	13·00	Genuine and rich.
" 27	"	23849	Angus McKenzie, Campbellton, N.B.	John Mair, Addington Parish, N.B.	1·0309	86·39	4·40	9 21	13·61	" "
" 27	"	23850	" "	William Pratt, Addington Parish.	1·0309	86 76	4·04	9·20	13 24	" "

APPENDIX C.

BULLETIN No. 89--FLAVOURING EXTRACTS

OTTAWA, September 8, 1903.

W. J. GERALD, Esq.,
Deputy Minister of Inland Revenue.

SIR,—I beg to transmit herewith enclosed a report by Mr. McGill on the samples of flavouring extracts which were collected in accordance with your instructions of March 27 last. The nature of these samples, together with the names of the vendors and manufacturers, are detailed in Table I which is appended to this report. The numbers of the samples, as collected by the food inspectors, are also given in this table, and by means of these numbers the results of the examination of each sample may be traced in Mr. McGill's report and tabulated statements. The latter are six in number and bear the following titles :—

II. Commercial Extract of Lemon.
III. Commercial Extract of Vanilla.
IV. Flavouring Essences.
V. Essence of Peppermint.
VI. Essence of Raspberry.
VII. Essence of Strawberry.

I have the honour to be, sir,
Your obedient servant,

THOMAS MACFARLANE,
Chief Analyst.

I.—List of Samples of Flavouring Extracts as collected in 1903.

DISTRICT OF HALIFAX.

Date of Collection	Nature of Sample.	Number of Sample.	Name and Address of Vendor.	Quantity.	Cost.	Name and Address of Manufacturer or Furnisher as given by Vendor.
1903.					$ cts.	
April 16.	Extract of lemon	20236	Cain Bros., Yarmouth	3 bottles.	0 30	Dearborn & Co., St. John.
" 16.	" "	20237	J. A. Craig, Yarmouth	3 "	0 30	Vendor.
" 20.	" rose	20250	Murphy & Demont, Windsor	3 "	0 30	Simson Bros., Halifax.
" 20.	" raspberry	20251	" "	3 "	0 30	H. Jonas, Montreal.
" 20	" lemon	20254	Shand Bros., Windsor	3 "	0 30	J. B. Black, Truro, N.S.
" 20	" vanilla	20255	" "	3 "	0 30	" "
" 20.	" almond	20258	Wentworth Stores, Ltd., Windsor	3 "	0 30	Dearborn & Co., St. John.
" 22.	" "	20305	A. F. Ross, Truro, N.S	3 "	0 30	H. Jonas, Montreal.
" 22.	" lemon	20308	R. T. Forristall, Halifax	3 "	0 30	Imperial Extract Co., Toronto.
" 22.	" vanilla	20309	" "	3 "	0 30	" "
" 17.	" lemon	4321	Geo. Rackham, Charlottetown	6 ounces.	0 60	
" 20.	" vanilla	4326	J. A. Gourlie, Summerside	6 "	0 60	
" 20.	" almond	4328	" "	6 "	0 60	
" 20.	" vanilla	4338	John Knight, Georgetown	6 "	0 75	
" 20.	" lemon	4339	" "	6 "	0 54	

DISTRICT OF NEW BRUNSWICK.

April 11.	Extract of vanilla	17857	F. E. Williams Co., Ltd., cor. Princess and Charlotte streets, St. John	3 bottles.	0 60	McLaren's, Hamilton.
" 11.	" lemon	17858	Van Wart Bros., cor. Duke and Charlotte streets, St. John	3 "	0 60	Seeley Manufacturing Co., Detroit, U.S.
" 16.	" vanilla	17875	King-Ashbell Co., Broad street, Sussex	3 "	0 60	Toronto Coffee and Spice Co.
" 14.	" almond	17870	James Collins, Union street, St. John	3 "	0 60	Seeley Manufacturing Co., Detroit.
" 17.	" peppermint	17884	W. G. Bell, 314 Main street, Moncton	3 "	0 45	Bennett Chemical Co., Toronto.
" 18.	Flavouring extract	17893	Robertson & Givan, Main and Duke streets, Moncton	3 "	0 60	Seeley Manufacturing Co., Detroit.
" 21.	Extract of lemon	17897	S. C. Stewart, King street, St. Stephen	3 "	0 90	Baird Co., Ltd., Woodstock, N.B.
" 22.	" cinnamon	17902	H. E. Hill, King street, St. Stephen	3 "	0 60	H. Jonas, Montreal.
" 25.	" pineapple	17912	W. R. Logan, Fredericton	3 "	0 45	Pure Gold Manufacturing Co., Toronto.
" 25.	" wintergreen	17914	H. C. Jewett, Regent street, Fredericton	3 "	0 30	Baird Co., Ltd., Woodstock, N.B.

DISTRICT OF QUEBEC.

April 17	Extract of vanilla	23344	H. Robert, St. Hyacinthe	3 bottles	0 30	J. V. Boudrias, Montreal.
" 20	" "	23348	Victor Trudeau, St. Lambert	3 "	0 45	A. Huckels & Co., Ottawa.
" 21	" "	23358	Gerard Harbière, Lacolle	3 "	0 30	Mayelle & Co., Toronto.
" 22	" peppermint	23359	Smallman & Vass, Lacolle	3 "	0 30	Brayley & Sons, Montreal.
" 22	" "	23360	" "	3 "	0 45	Davis Lawrence Co., Montreal.
" 28	" cloves	23375	L. S. Plamondon, South Durham	3 "	0 30	" "
" 28	" lemon	23374	" "	3 "	0 30	Hudon & Orsoli, Montreal.
" 29	" orange	23380	Romuald Piette, Berthierville	3 "	0 30	Hudon & Hebert Co., Montreal.
May 1	" raspberry	23387	J. E. Pichette, Joliette	3 "	0 75	F. F. Dalley Co., Ltd., Hamilton.

DISTRICT OF MONTREAL.

April 28	Extract of vanilla	21307	A. Archambault, 2045 St. James st., St. Henri	5 bottles	0 50	H. Jonas, Montreal.
" 28	" lemon	21308	Z. Trudeau, Notre Dame street, St. Henri	5 "	0 23	
" 29	" raspberry	21309	A. Laing, 2023 Notre Dame, Montreal	5 "	0 40	Laporte, Martin & Co., Montreal.
April 29	Extract of strawberry	21310	A. Laing, 2023 Notre Dame street, Montreal	5 bottles	0 40	Laporte, Martin & Co., Montreal.
" 29	" vanilla	21311	" " "	5 "	0 40	" "
May 6	" "	21312	Keddy & Kenny, Hemmingford	5 "	0 50	L. Silverman, Montreal.
" 7	Cochineal	21313	C. Bisson, St. Vincent de Paul	5 "	0 50	Jos. Contant "
" 7	Extract of lemon	21314	" "	5 "	0 50	" "
" 7	" cinnamon	21315	W. P. Brennan, St. Therese	3 "	0 60	H. Jonas
" 7	" vanilla	21316	" "	3 "	0 60	" "

DISTRICT OF KINGSTON.

April 20	Extract of pineapple	23147	H. T. Hamly, Walton street, Port Hope	5 bottles	0 40	Imperial Extract Co., Toronto.
" 20	" "	23148	D. J. McDonald, Pitt street, Cornwall	3 "	0 60	F. F. Dalley Co., Hamilton.
" 20	" vanilla	23149	" "	3 "	0 60	" "
" 20	" raspberry	23150	" "	5 "	0 50	" "
" 20	" strawberry	23151	" "	5 "	0 50	" "
" 20	" vanilla	23152	W. H. Dunkin "	5 "	0 75	Seeley Manufacturing Co., Detroit.
" 20	" lemon	23153	" "	5 "	0 75	" "
" 20	" "	23154	" "	5 "	0 50	" "
" 20	" cochineal	23155	" "	5 "	0 50	" "
" 20	" raspberry	23156	" "	5 "	0 50	" "

I.—List of Samples of Flavouring Extracts as collected in 1903—*Continued.*

DISTRICT OF TORONTO.

Date of Collection	Nature of Sample.	Number of Sample.	Name and Address of Vendor.	Quantity.	Cost.	Name and Address of Manufacturer or Furnisher as given by Vendor.
1903.					cts.	
April 15..	Extract of lemon	23431	F. Patience, 429 Yonge street, Toronto	5 bottles.	0 38	Imperial Extract Co., Toronto.
" 15..	" "	23432	" " "	5 "	0 25	J. M. Lowe, Toronto.
" 15..	" vanilla	23433	Hobley Bros., Dunlop street, Barrie..	5 "	0 50	Tropical Extract Co., Toronto.
" 17..	" strawberry	23434	C. H. Peebles, Market Square, Hamilton	5 "	0 40	F. F. Dalley Co., Hamilton.
" 17..	" raspberry	23435	" " "	5 "	0 40	" "
" 17..	" lemon	23436	" " "	5 "	0 60	" "
" 18..	" "	23102	Bradley & Son, St. Paul street, St. Catharines..	5 "	0 25	Pure Gold Manufacturing Co., Toronto.
" 18..	" vanilla	23104	" " "	5 "	0 42	Todhunter & Mitchell, Toronto.
" 18..	" wintergreen	23105	" " "	5 "	0 42	" "
" 20..	" lemon	23115	E. Brown, George street, Peterboro	5 "	0 60	F. F. Dalley Co., Hamilton.

DISTRICT OF WINDSOR.

April 9..	Extract of lemon	22043	J. W. Irwin, Clinton, Ont.	3 bottles.	0 30	London Coffee and Spice Co.
" 9..	" vanilla	22045	Sturdy & Co., Goderich, Ont.	3 "	0 30	" "
" 13..	" "	22048	E. O'Flaherty, Stratford, Ont.	3 "	0 30	Imperial Extract Co., Toronto.
" 13..	Flavouring extract	22052	W. W. Hill, Mitchell, Ont.	3 "	0 30	Gorman & Eckhart, London.
" 13..	Extract of strawberry	22055	Wm. Stoneman, Mitchell	3 "	0 30	Warren Bros., Toronto.
" 15..	" vanilla	22061	Peter Dill, Seaforth, Ont	3 "	0 30	Imperial Extract Co., Toronto.
" 16..	Flavouring extract	22066	Stuebing & Co., Berlin	3 "	0 30	F. F. Dalley, Hamilton.
" 17..	" "	22075	John Sloan & Co., Galt	3 "	0 30	Seeley Manufacturing Co , Detroit.
" 18..	Extract of vanilla	22076	J. A. McCrea, Guelph	3 "	0 30	Vendor.
" 18..	" "	22077	" "	3 "	0 75	McLaurins, Hamilton.

DISTRICT OF WINNIPEG.

April	15	Flavouring extract	17431	H. Meikle, Morden	8 ozs.	1 95	Seeley Manufacturing Co., Hamilton.
"	17	"	17437	C. E. Gutteridge, Deloraine		0 75	Mayells & Co., Toronto.
"	21	"	17444	N. Rosen, Virden	3 bottles	0 75	F. F. Dalley, Hamilton.
"	23	"	17447	White & Co., Moosomin	3 "	0 60	Balfour & Co., Hamilton.
"	24	"	17450	Mutter & Lynch, Brandon	3 "	0 75	Pure Gold Manufacturing Co., Toronto.
"	24	Strawberry extract	17455	Miss A. Jones, Carberry	3 "	0 75	Blue Ribbon Manufacturing Co., Winnipeg.
"	25	Extract of banana	17458	C. S. B. Burley, Portage la Prairie	3 "	0 75	Pure Gold Manufacturing Co., Toronto.
May	6	" lemon	17466	Bailey's Fair, Winnipeg	3 "	0 30	Dyson Co., Winnipeg.
"	6	" vanilla	17468	Burke Bros., Winnipeg	3 "	0 60	Imperial Extract Co., Toronto.
"	6	Flavouring extract	17471	A. Hendry, Winnipeg	3 "	0 75	Sheriffs, Toronto.

DISTRICT OF MANITOBA.

April	21	Extract of lemon	21714	Postell & Co., Red Deer	3 bottles	1 20	Seeley Manufacturing Co., Hamilton.
"	23	" vanilla	21718	R. A. Dickson, Wetaskiwin	3 "	1 80	" " "
"	24	" lemon	21720	Ross Bros., Edmonton	3 "	1 35	Dalley, Winnipeg.
"	25	" "	21724	Bowers & Morrison, Strathcona	3 "	1 05	Eby & Blain, Toronto.
"	29	" vanilla	21727	W. Pitman, Calgary	3 "	0 75	Dominion Extract Co.

DISTRICT OF BRITISH COLUMBIA.

April	16	Flavouring extract	21688	A. T. Charleton, Port Stanley	2 bottles	0 35	Snow Drift Baking Powder Co.
"	16	Extract of lemon	21694	H. Alder, Mount Lehman	3 "	0 75	D. S. Curtis, New Westminster.
"	17	" almond	21695	A. C. Henderson, Chilliwack	3 "	0 75	B. C. Fruit Canning and Spice Co.
"	17	" orange	21696	" "	3 "	0 75	Blue Ribbon Manufacturing Co., Hamilton
"	17	" apricot	23501	G. R. Ashwell & Sons, Chilliwack	3 "	0 75	W. Tufts & Son, Vancouver.
"	17	" lemon	23505	Mrs. E. A. Farrer, Chilliwack	3 "	0 75	Dyson-Gibson Co., Winnipeg.
"	18	" wintergreen	23508	Harrison River Mills Timber and Trading Co.	3 "	0 45	Langley & Henderson, Victoria.
"	18	" vanilla	23510	M. Desbrosay, Mission, B.C.	3 "	0 75	Great West Spice Co., Winnipeg.
"	22	" lemon	23525	Marshall Smith, Ladner's Landing	3 "	0 45	Woods, Ladner's Landing.
"	28	" vanilla	23548	Pamett & Gamo, New Westminster	3 "	0 50	McLaren, Hamilton.

LABORATORY OF THE INLAND REVENUE DEPARTMENT.

OTTAWA, September 4, 1903.

THOMAS MACFARLANE, Esq., F.R.S.C.,
Chief Analyst.

SIR,—I have the honour to hand you, in tabular form, with appended notes, the results of work upon a large number of samples of flavouring essences; as also upon two samples of cochineal extract, which does not properly come under this head, being used for colouring rather than for flavouring.

Since no generally accepted standards exist for the preparation of these substances, I have thought it sufficient to ascertain the absence of matters dangerous to health; and I find nothing that can be condemned on this score. The question of foreign colouring matter, in its relation to health, must be considered an open one for the present.

The small quantity of material at my disposal has prevented fuller investigation in certain directions. In the event of another collection of like kind, I beg to recommend that officers be instructed to confine their samples to one particular essence or extract at a time, so that fuller justice may be done to it.

In the work recorded I have received very material help from Mr. Lemoine and Mr. Valin.

I have the honour to be, sir,
Your obedient servant,

A. McGILL.

COMMERCIAL EXTRACT OF LEMON.

Essence of Lemon.—The B. P. defines a tincture of lemon to be prepared from fresh lemon peel and alcohol of 90 per cent. The finished product would contain about 70 to 80 per cent alcohol by volume.

The U. S. P. defines an essence or spirit of lemon to be made from oil of lemon and lemon peel, macerated with alcohol of 95 per cent. The finished product would in this case contain a somewhat higher percentage of alcohol; probably from 80 to 90 per cent by volume.

Extract of lemon, as used for flavouring pastry, custards, &c., is a preparation which, so far as I know, has no legally defined composition. It is popularly supposed to be prepared like the pharmacopœal tinctures, by extracting lemon peel with alcohol, or by dissolving oil of lemon in alcohol.

Oil of lemon is the oil expressed from fresh lemon peel. It consists chiefly of hydrocarbons of the terpene series, but its characteristic flavour is due mainly to an aldehyde, or to a mixture of aldehydes, present to the extent of from 4 to 8 per cent. The principal aldehyde (citral) occurs in commerce under that name: and much of the lemon extract sold for flavouring purposes is made directly from citral. A very small quantity of citral suffices to give the lemon flavour and an economy of alcohol results from the substitution of citral for oil of lemon; this last requiring strong alcohol for its solution.

Commercial citral contains a trace of oil of lemons. A sample reported in the accompanying table contained 0·5 per cent, This minute amount of oil of lemon, accidentally present, cannot be held to make the use of citral equivalent to the use of oil of lemon in the manufacture of extract or essence of lemon. While the flavour of lemon is chiefly due to the citral which it contains, it is certain that other substances are involved in the total natural flavour, and these must, of course, be absent from a so-called extract made from citral. A German Imperial patent (No. 134,788)[1] recently granted to Heine & Co., prepares an artificial oil of lemon "by adding to a mixture of

92 parts of limonene and phellandrine, a mixture of citral, citronellal, geraniol, geranyl acetate, linalool and linalyl acetate, also 1 part of a mixture of nonylic and octylic aldehydes. The exact amount of the aldehydes depends upon the character and strength of the lemon odour desired.' I quote this formula in order to emphasize the fact that it is not alone to citral that lemon extract or essence owes its true flavour.

A recent decision in the Supreme Court of Michigan, rendered April 7, of this year, reversed a decision of a lower court, by which a so-called extract of lemon, made from citral, and artificially coloured, had been held to be adulterated. The manufacturers of terpeneless extracts claim better keeping qualities for such preparations, and less tendency to oxidize, thus developing disagreeable taste. It is also claimed that the full characteristic flavour of the lemon is conserved. Final opinion in this matter lies beyond the domain of the chemist, and an appeal must be made to the palate of the connoisseur. But it will be seen, from the accompanying tables, that whenever any considerable amount of oil of lemon is present at least 75 per cent of alcohol is present. This alcohol is the chief item of cost in manufacture, and it is reasonable to infer that the disuse of oil of lemon is at least in part accounted for by the possibility of employing weaker alcohol.

Most of the samples examined are coloured by coal-tar dyes—chiefly naphthol yellows and tropœolin. A normal extract of lemon has little or no colour, and it is regrettable that there should be a popular demand for lemon extract of a decided yellow. While I have no proof that these dyes, used in the minute amounts necessary to colour the extracts, are actually injurious to health, it has been clearly proven (Bulletin 53, p. 14) that they are poisons in considerable doses.

A. J. Winogradow (2) has demonstrated by recent experiments that so little as 1 millegramme (= 0.015 grain) of certain coal-tar dyes entirely prevents the digestion of egg albumen by pepsin.

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[1] Pharmaceutical Review, 1903, p. 24.

(2) Zeitschrift, Untersuchung Nahr. u. Genussmittel 1903, 589-592.

II.—COMMERCIAL

ARRANGEMENT of Samples in order

Serial Number.	Name of Manufacturer.	Departmental number of samples.	Specific gravity of the sample, 15·5°C.	Specific gravity of the distillate to equal volume.	PER CENT *ALCOHOL BY VOLUME. (APPROXIMATE). As alcohol	As proof spirit.	Fixed residue at 100°C. Grammes per 100 CC.
1	Unknown	20237	0·8260		92·36	161·86	0·39
2	Schilling	23525	0·8273		91·96	161 16	0·50
3	Dyson, Gibson Co., 'White Star'	23505	0·8444		86·80	152·11	0·14
4	Davis & Lawrence	23363	0·8513		84·51	148·09	0·19
5	Dalley	17444 21720	0·8577		82·30	144·23	0·09
6	Dearborn	20236	0·8666		78·89	138·25	0·17
7	Black	20254	0·8758		75·53	132·36	0·06
8	Jones	21314	0·8758		75·53	132·36	0·08
9	Seely	21714 23153 17858	0·8974		66·94	117·32	0·91
10	Unknown	21694	0·9016		65·17	114·20	0·05
11	Simson Bros	4339	0·9097		61·53	107·84	0·13
12	Baird	17897	0·9186		57·64	101·02	0·13
13	Sherriff	17471	0·9380		48·21	84·49	0·08
14	McLaren	23115	0 9412		46·48	81·45	0·08
15	Robt. Greig Co	4321	0·9428		45·53	79·79	0·18
16	Dalley	23148	0·9598		34 69	60·79	
17	Mayell	17437	0·9608	0·9612	33·64	58·97	0·07
18	Hudon & Orsali	23374	0·9650		30 57	53·56	0·08
19	Unknown	21308	0·9663		29·40	51·53	0·07
20	Peebles	23436	0 9682		27·68	48·50	0·04
21	Unknown	23103	0·9685	0·9688	27·13	47·55	0·09
22	London Coffee and Spice Company	22043	0 9688		27·13	47·55	0·07
23	Dyson, Gibson Co., 'Jewel Ext.'	17466	0·9702		25 86	45·31	0·12
24	Eby Blain Co	21724	0·9712		24·88	43·60	0·07
25	Unknown	23431	0·9722	0·9721	23·88	41 85	0·06
26	Wright (Detroit)	23154	0·9751		21 09	36·95	0·04
27	Unknown	23432	0·9752		20·99	36·78	0·13
	Oil of lemon		0 8583				3·00
	Citral		0 8950				58·00

* Owing to the very small amounts of solids in solution, I have considered that a sufficiently close

Ottawa, August 25, 1903.

EXTRACT OF LEMON.

of Specific Gravity (Density).

Reaction on pouring a few drops into water.	Rotation, 2 dm. tube. Degrees of sugar scale.	Equivalent volume per cent of lemon oil.	Wool-test for colouring matters. Dyes.	Reaction with dilute hydrochloric acid.	Remarks.
Turbid	+ 15·1	4·7	Uncoloured	None	Genuine.
"	+ 49·5	15·5	"	"	Genuine, and of exceptionally high strength.
"	+ 10·9	3·4	Yellow	Bleached	Contains 3·4 p.c. oil of lemons; is artifically coloured.
"	+ 20·0	6·2	Uncoloured		Genuine, and above usual strength.
"	+ 11·1	3·5	Yellow	Bleached	Contains 3·5 per cent oil of lemons; is artificially coloured.
"	+ 7·0	2·2	"	"	Contains 2·2 per cent oil of lemons; is artificially coloured.
"	1·5	0·5	Deep yellow	"	Contains 0·5 per cent oil of lemons; is artificially coloured.
"	+ 7·0	2·2	Orange	Reddish	Contains 2·2 per cent oil of lemons; is artificially coloured.
	+ 4·0	1·3	Deep yellow	Bleached	Contains 1·3 per cent oil of lemon; is artificially coloured.
	+ 1·5	0·5	Uncoloured	None	Contains 0·5 per cent oil of lemons.
"	+ 1·4	0·4	"	"	" 0·4 "
"	+ 1·3	0·4	Deep yellow	Bleached	Contains 0·4 per cent oil of lemons; is artificially coloured.
Slightly turbid	- 0·4	0·1	Yellow	Red	Contains a trace of oil of lemons; is artificially coloured.
"	0·4	0·1	"	No change	" " "
Clear	- 0·2	0·1	"	Bleached	" " "
			Deep yellow	"	" " "
"	+ 0·3	0·1	Yellow	"	" " "
"	+ 0·2	0·1	"	"	" " "
"	+ 0·3	0·1	Deep yellow	"	" " "
"	+ 0·2	0·1	Yellow	"	" " "
"	+ 0·3	0·1	"	"	" " "
"	+ 0·3	0·1	"	Red	" " "
"	+ 0·3	0·1	Deep yellow	No change	" " "
"	- 0·2	0·1	Light yellow	Bleached	" " "
"	- 0·3	0·1	"	Red	" " "
"	+ 0·0	0·0	Yellow	Bleached	Contains no oil of lemons; is artifically coloured.
"	+ 0·3	0·1	Deep yellow	"	Contains a trace oil of lemons; is artificially coloured.
	+322·0	100·0			
	+ 1·6	0·5			

approximation to the alcohol content was obtainable from the specific gravity of the sample.

III.—COMMERCIAL

Serial Number.	Name of Manufacturer.	Departmental Number.	Specific Gravity of the Sample.	Spirit Gravity.	Alcohol—by Volume.		Specfic Gravity of de-alcoholized residue.
					Alcohol.	Proof Spirits.	
					p. c.	p. c.	
1	Black	20255	1·0465	0·9847	11·87	20·81	1·0603
2	Dalley	23149	1·0485	0·9746	21·59	37·83	1·0825
3	Dull	22061	0·9844	0·9781	18·14	31·80	1·0066
4	Gourlie	4326	0·9400	0·9337	50·47	88·44	1 0064
5	Huckels	23348	1·0058	0·9865	10·30	18·04	1·0190
6	Imperial Extract Co	20309 22048	0·9985	0·9787	17·48	30·64	1·0070
7	Jonas	21307 21316	0·9919	0·9640	31·40	55·03	1·0309
8	Knight, John	4338	0·9718	0·9520	40·14	70·34	1·0219
	Laporte & Martin	21311	1·1060	0·9924	5·47	9·58	1·1115
10	London Coffee & Spice Co	22045	1·0440	0·9811	15·21	26·66	1·0631
11	Mayell	23358	1·0470	0·9841	12·40	21·73	1·0719
12	McLaren	17857 22077 23548	0·9906	0·9648	30·73	53 86	1·0270
13	Peerless Extract Co	23510	1·0164	0·9853	11·35	19·89	1·0312
14	Seely	17431 21718 22075 23152	1·0185	0·9741	22·09	38·71	1·0440
15	Tropical Extract Co	20309 22048	1·0302	0·9865	10·30	18·04	1·0443
16	Toronto Coffee & Spice Co. (Silver Label).	17875	1·0169	0·9792	16·98	29·76	1·0377
17	" "	23344	1·0262	0·9857	11·00	19·27	1·0376
18	" "	22076	0·9932	0 9832	13·24	23·21	1·0107
19	" "	21312	0·9997	0·9844	12·13	21·27	1·0160
20	" "	21727	1·0344	0·9841	12·40	21·73	1·0484
21	" "	23104	1·0576	0·9768	19·49	34·14	1·0802

August 27, 1903.

SESSIONAL PAPER No. 14

Extract of Vanilla.

Polarimeter reading of residue in 2 dm. tubes. Corrected for Volume.	Cane Sugar.	Vanillin.	Coumarin.	Sum of these.	Remarks.
		Per 100 Volumes.			
	p. c.				
− 32·8	8 5	0 028	0 056	0·084	
− 52·5	13 7	0 080	0·036	0·116	
+ 4 2	1 2	0·040	0·040	0·080	
− 3·0	0 8	0·044	0 060	0·104	Unusually high content in alcohol.
2 4	0 6	0 060	0 060	0·120	
3·6	0 9	0 048	0 040	0 088	
18 5	4 8	0·108	0·040	0·148	
19 2	5·0	0 032	0 016	0·048	Filtrate after clarifying with lead acetate is quite colourless. Unusually high content in alcohol.
96·0	25 0	0·012	0 144	0·156	Very low content of alcohol. Flavour chiefly due to coumarin.
51·6	13 4	0·076	0 024	0·100	
− 45 6	11 9	0·076	0·062	0·138	
− 18 5	4 8	0 048	0 036	0·084	
− 24 0	6 2	0 268	0 036	0 304	Contains a red dye of coal tar origin. Notably high content of vanillin.
26·1	6 8	0·080	0 028	0·108	
− 31 4	8 2	0 024	0·112	0·136	Flavour chiefly due to coumarin.
− 31·6	8·2	0 028	0 072	0·100	" "
+ 2·4	0·6	0 040	0·092	0·132	" "
+ 7·8	2 0	0·104	0·064	0·168	
+ 6 0	1·6	0 036	0·032	0·068	
34·2	8·9	0 028	0·036	0·064	
+ 43·8	11 4	0 028	0·160	0·188	" "

Commercial Extract of Vanilla.

This should be made from the dried fermented pod of *vanilla planifolia*, a plant which is cultivated in Mexico, Java and elsewhere. This fruit, as it comes into commerce, varies greatly in quality, the best coming from Mexico.

The flavour is chiefly due to a substance called *vanillin* (the aldehyde of methyl proto-catechuic acid) which occurs to the extent of from 1 to 2.75 per cent in the fruit.

Artificial *vanillin* is made on an industrial scale in Germany, and there is no doubt that much of the extract of vanilla of commerce is prepared directly from artificial vanillin. Regarding artificial vanillin, P. Carlos (1) 'Considers that, although synthetic vanillin may reproduce the odour of vanilla, it has not by any means the same delicacy of flavour; for flavouring chocolate and similar confectionery it is stated not to possess the same softness of flavour.'

Vanilla is not mentioned in the British Pharmacopœia. A tincture is defined in the U. S. P. to be made from vanilla, sugar and diluted alcohol. The finished tincture contains about 50 per cent (volume) of alcohol.

Coumarin is a substance having much the same flavour as vanillin, and is therefore capable of being substituted for this last in the manufacture of a *soi-disant* extract of vanilla. Coumarin (the anhydride of ortho-coumaric acid) occurs in the tonka-bean and in many other plants. It is also prepared artificially from salicylic aldehyde by several methods. However legitimate a substance, for use as a flavour, coumarin may be,—it is certainly to be considered as an adulterant when substituted for the more expensive vanillin, and sold under the name of vanilla.

Methods for the estimation of vanillin and coumarin in admixture have been worked out by several chemists. Those of Hess and Prescott, as modified by Winton and Silverman (1) have been employed in this laboratory.

Reference to the accompanying tables will show that coumarin is present, to some extent, in all the samples analysed, while in some of them it constitutes by far the greater portion of the aromatic ingredient of the extract.

The great range of variation in these extracts of vanilla is noteworthy. The following statement may make this point clearer:—

In 21 samples analysed—

Vanillin varies in amount from	.....	0·012 to 0·268
Coumarin " "	.....	0·016 to 0·160
Alcohol " "	.....	5·47 to 50·47
Sugar " "	.....	0·6 to 25·0

It follows from this variability that most perplexing results to the consumer must be found when the article as made by one manufacturer is substituted for that made by another. It would be interesting to know what degree of constancy may be expected in the output of any single manufacturer. On account of the large amount of work in hand, and the small quantity of material furnished for analysis in many cases, I have considered it best to mix the different samples bearing the same maker's name, and work them as one sample. This has been done in the case of numbers 6, 7, 12, 14 and 15 of the accompanying table.

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(1) Repertoire de Pharmacie, 14, 5—through Year Book of Pharmacy, 1902, 297.

(1) Journal American Chemical Society—Vol. 21, 256 and 721, and Vol. 24.

IV. Flavouring Essences.

Serial Number.	Departmental Number.	Name.	Name of Manufacturer.	Specific Gravity of Sample.	Fixed residue.	Alcohol (approximate). Volume per cent		Remarks.
					Per 100cc.	Alcohol.	Proof Spirit.	
1	4328	Almonds	Lymans Sons	0·9244	0·070	55·0	96·3	
2	17870	"	Seely	0·9134	0·050	59·9	105·0	
3	20258	"	Dearborn	0·9584	0·030	37·1	65·0	
4	20305	"	Jonas	0·9006	0·030	65·6	114·9	
5	21695	"	Fruit Canning Co	0·9357	0·170	49·5	86·7	Contains a yellow dye.
1	17914	Wintergreen	Baird Co	0·9164	0·100	58·6	102·7	
2	23105	"	Bradley & Son	0·9668	0·140	29·0	51·0	
3	23508	"	Langley & Henderson	0·8442	0·110	86·9	152·2	
1	21313	Cochineal	Constant	1·1478	30·460	None.	...	Polarization —8.
2	23115	"	Imperial Extract Co.	1·3024	87·460	"	...	" +16. Contains sugars and a foreign dye.
1	17893	Rose	Seely	0·9075	0·030	62·6	109·6	
2	20250	"	Simson Bros	0·9583	0·050	35·8	62·8	
1	23501	Apricot	Tufts & Son	0·9477	0·260	42·6	74·6	Contains a red dye.
1	17458	Banana	Pure Gold Co	0·9674	0·040	28·4	49·8	" yellow dye.
1	17902	Cinnamon	Jonas	0·8764	0·630	75·5	132·2	
2	21315	"	"	0·9202	0·920	57·0	100·0	
3	22066	"	Dalley Co	0·9405	0·440	47·0	82·6	" brown dye.
1	23375	Cloves	Davis, Lawrence Co	0·8517	1·010	85·0	149·0	
1	17912	Pineapple	Pure Gold Co	0·9283	0·090	53·0	93·0	" yellow dye.
2	23147	"	Imperial Extract Co	0·9613	0·240	33·8	59·3	" red dye.
1	21696	Orange	Blue Ribbon	0·9538	0·060	39·0	68·0	" yellow dye.
2	23380	"	Hudon Hebert	0·9668	0·050	29·0	50·9	" "

Essence of Almonds.—The U. S. P. (1890) gives a formula for essence of bitter almonds which requires 75 per cent alcohol (volume) in the finished product which also contains 1 per cent of bitter almond oil.

Essence of Wintergreen, is not officinal in the B.P. The U.S.P. defines a spirit of wintergreen, made from dissolving 5 volumes of oil of gaultheria in 95 volumes alcohol (94% vol).

The U.S.P. distinguishes between natural and artificial oil of wintergreen directing the first to be prepared from the leaves of *Gaultheria procumbens* by distillation, while the latter is methyl salicylate. They are defined however, as being essentially the same.

Essence of Rose.—Rosae Oleum, Oil of Rose or Otto of Rose is defined in both B.P. and U.S.P. Rose water is made by distilling water from the flowers of Rosa Damascena. No essence of rose is mentioned.

Essences of Apricot and Banana.—No preparations from apricot or banana are mentioned in any pharmacopœia.

Cochineal.—Tincture of cochineal is defined by the B.P. to be made from cochineal (1 part) and alcohol of 45 p.c. strength (10 parts).

The essence or extract of cochineal is sold for giving colour to jellies, &c., and not like other extracts for flavouring purposes. So long as the colouring matter of cochineal is extracted and kept in solution in such a way that it shall not mould, the object of the manufacturer is served. A formula employing alum, cream of tartar, glycerine, alcohol and other ingredients is published in Part II of the U. S. Dispensatory, 17th Edn. It should be quite unnecessary to add a foreign colouring matter to cochineal.

Essence of Orange.—The B. P. defines a tincture of orange made from orange peel, with 90 per cent alcohol. The finished product would contain from 70 to 80 per cent alcohol.

The U. S. P. defines a spirit of orange made from oil of orange peel and alcohol of 95 per cent. The alcoholic strength would be about 10 per cent higher than in the former case.

The two samples examined show a much lower content than this.

Essence of Cinnamon.—The B. P. defines a spirit of cinnamon, containing 1 part of oil of cinnamon in 10 parts of the product ; the solvent being 90 per cent alcohol.

Also, a tincture of cinnamon made from the bark, with 70 per cent spirit.

The U. S. P. *Spiritus Cinnamomi* is practically identical with that of the B. P. The tincture contains glycerine.

It does not follow that an essence prepared for the kitchen must come up to pharmacopœal standard.

Schimmel & Co. have recently taken out a patent for an artificial cinnamon oil.

Essence of Cloves.—The British Pharmacopœia defines an infusion of cloves ; but neither essence nor tincture is defined in B. P. or U. S. P.

Pineapple Essence is not defined in any pharmacopœia.

V.—Essences of Peppermint.

Serial Number.	Departmental Number.	Manufacturer.	Specific Gravity of Sample.	Fixed Residue, per 100cc.	Rotation in 2 dm. tube, Sugar Scale.	Alcohol (approximate) Vol. per cent.		Remarks.
						Alcohol.	Proof Spirit.	
1	17884	Bennett Chem. Co..	0·8867	9·360	—3·2°	74·5	130·6	
2	21688	Snowdrift Co.....	0·9612	1·810	0·0°	34·5	60·5	Contains a yellow dye.
3	22052	Gorman, Eckhart Co.	0·9622	0·190	0·0°	33·1	57·9	" "
4	23359	Brayley Bros	0·9305	0·156	0·0°	52·2	91·6	" "
5	23360	Davis, Lawrence Co.	0·9117	0·800	0·0°	61·4	107·6	

Essence of Peppermint.

The B. P. defines a spirit of peppermint, made from oil of peppermint, to contain 10 per cent of this last, dissolved in 90 per cent alcohol. The resultant tincture would contain approximately 80 per cent of alcohol (volume).

The U. S. P. defines an essence containing 10 per cent oil of peppermint and 1 per cent of leaves, with alcohol of 94 per cent. The resultant tincture would much resemble the above.

It will be noted that only one of the samples analysed approximates to either of the pharmacopœal essences, and this is the only one showing presence of oil of peppermint by possessing optical activity. The oil of peppermint is lævo-gyratory, but appears to be very variable in the degree of rotation. A sample examined by me gave a reading —21·4° (sugar scale) in 2 dm. tube, on solution in alcohol to 10 volumes.

Owing to the presence of more or less sugar in the samples tabulated, the rotation observed cannot be taken as a safe guide to the oil present. The samples were too small to permit of fuller examination.

VI. Flavouring Essences—Raspberry.

Serial Number.	Departmental Number.	Manufacturer.	Specific Gravity of Sample.	Fixed Residue, per 100cc.	Rotation in 2 dm. tube, Sugar Scale.	Alcohol (approximate) Vol. per cent.		Remarks.
						Alcohol.	Proof Spirit.	
1	17450	Pure Gold Co. ..	0·9811	10·460	+25·6°	43·9	76·9	Contains about 6·7% sugar and a red dye.
2	20251	Jonas	0·9197	3·080	0·0	60·0	105·0	Contains a red dye.
3	21309	Laporte Martin....	0·9738	0·730	+1·8	25·0	44·0	" " and about 0·5% sugar.
4	23150	Dalley Co	0·9904	3·460	0·0	16·0	28·0	Contains a red dye.
5	23387	"	1·0373	20·140	+46·4	33·0	57·0	" " and about 12% sugar.
6	23435	"	0·9778	10·880	0·0	40·5	71·0	Contains a red dye.
7	23156	Imp. Ext. Co....	1·0038	9·830	0·0	17·0	29·8	" "

Note.—These are all artificially coloured. There is no accepted standard for the article, and it is evident that while each manufacturer has his own formula, this formula shows great elasticity.

VII.—Flavouring Extracts—Strawberry.

Serial Number.	Departmental Number.	Manufacturer.	Specific Gravity of Sample.	Fixed Residue, per 100cc.	Rotation in 2 dm. Sugar Scale.	Alcohol. (approximate) Vol. per cent.		Remarks.
						Alcohol.	Proof Spirit.	
1	17447	Whyte.....	0·9441	0·000	0·0	44·8	78·5	Contains a lavender dye.
2	17455	Blue Ribbon....	0·9753	4·870	-16·0	35·0	61·4	" crimson " and about 4·2% sugar.
3	21310	Laporte Martin.....	0·9705	0·170	0·6	25·0	44·0	Contains a purple dye.
4	22055	Warren Bros.....	0·9990	7·950	0·0	18·0	31·5	" red "
5	23151	Dalley Co	0·9845	4·160	0·0	26·0	45·5	" crimson "
6	23434	"	0·9820	0·930	+2·0	36·0	63·0	" purple " and about 0·5% sugar.

Note.—These essences are all artificially coloured. There is no accepted standard for this article.

APPENDIX D.

BULLETIN No. 90--HONEY, 1903.

LABORATORY OF THE INLAND REVENUE DEPARTMENT,

OTTAWA, October 2, 1903.

W. J. GERALD, Esq.,
Deputy Minister of Inland Revenue.

SIR,—I beg to submit herewith a tabulated statement (No. I) giving a description of the samples of honey which were collected according to your instructions of March 27 last, and which have been submitted to examination in this laboratory. Before referring to the particulars given in the table, it seems necessary to make the following explanatory remarks.

Honey is generally understood to be the sweet secretion which working bees produce from feeding on the nectar of the flowers, leaves, etc., of various plants and trees. As is well known, the aromatic constituents of many of these flowers are found in the honeys produced from them. Thus, in this country, clover, buckwheat and other honeys have been distinguished by their taste and aroma, while, on the continent of Europe, such names occur as linde, acacia, heath, conifer, forest and spruce honey. The nectar of flowers contains from 60 to 90 per cent of water, and both fruit sugar and cane sugar have been found in it. It experiences, in the stomach of the bee, certain changes which consist principally in an inversion of the cane-sugar. As is the case with many articles of food in Canada, 'the limits of variability' (see Section 19 of the Adulteration Act) permissible in honey have not yet been legally determined, but it seems to be generally accepted, not only by beekeepers but by the general public, that the feeding of bees in summer time with cane sugar or sugar solution, in order to increase the production, should be regarded as adulteration. This principle is expressly acted on by the association of Swiss Agricultural Chemists, who have also adopted 16 per cent cane sugar as the maximum limit which genuine honey ought to contain. Other chemists place the limit lower, and König states that natural honey may contain up to 8 or 10 per cent cane sugar. Experiments are on record which demonstrate that bees fed exclusively on cane sugar syrup produce a honey containing as much as 30 per cent cane sugar. Besides this adulteration, effected with the co-operation of the bees, honey may also be falsified by the direct addition of cane sugar or glucose (Starch sugar) syrup, the sophisticated honey in the latter case being sometimes sold as 'Swiss honey'. Neither of these varieties is difficult of detection, but it is otherwise in cases of an admixture of invert sugar, a substance produced by the action of dilute acids on cane sugar. This sort of adulteration has long been known, especially on the continent of Europe, where the product is sold under such names as 'Turkish honey', 'table honey' and 'prepared honey'. Not unfrequently it is more honestly termed 'sugar honey', or 'artificial honey,' (*Kunst honig*), and some of it is said to have come from America, in comb made from paraffine, and labelled as 'prime American honey.' Its manufacture has increased greatly during the last ten years. It is prepared with such skill as to baffle the efforts of German chemists to distinguish it from the genuine article, although both the German and the Belgian governments have sought by every means to protect the producers of pure honey. A recent memoir, emanating from the Imperial German Health Bureau, acknowledges that the trade in this artificial honey is very considerable, and that the addition of invert-sugar to genuine honey cannot be detected. (See *Zeitschrift für Untersuchung der Nahrungs- u. Genussmittel* for June 15, 1903.)

Whether it is likely that the last mentioned variety of spurious honey is sold in Canada, I am unable to state. I doubt whether invert-sugar is manufactured in Canada and certainly it is not imported under that name. There is, however, a considerable importation of honey itself, which is given in the Trade and Navigation Tables as follows:—

	Entered for Home Consumption for Fiscal Year ended June 30, 1902.	June 30, 1903.
Honey in the comb, or otherwise, and imitations thereof—	Lbs.	Lbs.
From Great Britain	31,856	6,209
" British West Indies	18,754	51,789
" Austro-Hungary	6,571	
" China	320	
" Germany	3,559	
" United States	85,451	62,606
Total	146,511	120,604

It would seem quite possible that some of this imported honey, upon which a duty of 3 cents per lb. has to be paid, may be of a spurious character.

The adulteration of honey by means of added water has also to be taken into consideration. The quantity in genuine honey seldom exceeds 20 per cent, and the maximum limit is not placed beyond 25 per cent by those chemists who have studied the subject.

In Table I will be found all the information, as well as analytical results, which is available regarding 99 samples of honey, which were collected in the open market and subjected to examination here. Besides the vendor's name and address, and those of the party from whom he is said to have procured the honey, there are given in a few cases designations indicating quality. Under the results of examination are given the direct saccharimeter reading, and the water percentage as the best discriminating tests for separating the apparently genuine from the apparently adulterated samples.

The direct saccharimeter reading of the 99 samples was observed in the same manner as in testing samples of cane sugar or molasses, by means of the Schmidt & Haensch improved instrument with triple field of vision. The number of degrees mentioned are therefore from observation of a 26.048 per cent solution in a 200 mm. tube. It will be observed that the great majority of the samples, 86 in number, give the levo-rotatory readings, said to be indicative of pure honey when an admixture of invert-sugar is excluded from consideration. It must not, however, be supposed that left hand rotation, even in the absence of invert-sugar will infallibly indicate a genuine honey. It is quite possible that honey, adulterated with a small proportion of glucose syrup, may still give a distinct levo-rotatory reading. An experiment on this point, made by Mr. McGill, may here be put on record. 93 parts of honey reading —16·2° at 20° C. were mixed with 7 parts of ordinary glucose, reading +88° at 30° C. This adulterated honey read (after boiling and cooling the solution to correct bi-rotation) —4·3° at 20° C. The most of the samples, 69 in number, showed crystallization, while in 17 there was no such appearance. In this separation of the sugars, dextrose or grape sugar preponderates over the levulose or fruit sugar. These sugars are present in the honey itself in somewhat different proportions from those contained in invert-sugar, the levulose prevailing to a slight extent. Since 'it is held by experienced beekeepers that all genuine honey will eventually crystallize, and hence that honey warranted to remain syrupy is probably adulterated' (Allen), it is quite possible that some of these clear honeys may have contained an addition of invert-sugar. No less than 13 samples showed positive rotation, and, as probably adulterated samples, were subjected to further examination, the details of which are given in a separate table, No. II. The final conclusions arrived at regarding the adulteration of these are however incorporated in Table I, while the more technical explanations regarding the methods of examination are given in a memorandum appended to Table II.

The percentage of water stated in Table I was obtained by evaporating 10 ccm of a 5 p.c. solution of the sample in crysotile fibre for 24 hours at a temperature varying from 60° to 70° Centigrade, but never exceeding the latter figure. Only 8 of the samples were found to contain moisture to the extent of 25 p.c. and over, namely :—

No.	17887	with	27.4	p.c. and	– reading ;	clear.
"	17896	"	25.6	"	"	"
"	21300	"	25.0	"	"	"
"	21301	"	32.6	"	"	cryst.
"	21305	"	28.8	" and	+ reading ;	clear.
"	23101	"	26.4	"	"	"
"	17464	"	25.6	" and	– reading ;	cryst.
"	17467	"	27.4	" and	+ reading ;	clear.

Significantly enough, three of these belong to the samples showing right-handed polarization and classed as adulterated. Other three belong to the class showing left-handed polarization, but suspected of adulteration with invert-sugar on account of their clearness. The remaining two gave minus readings and crystallization and are the only ones which may fairly be suspected of containing added or, at any rate, too much water.

It will be observed that some of the adulterated samples contained fragments of comb floating in the honey, which had to be separated previous to examination. This is, of course, a very different thing from honey in the comb. Most likely the general consumer might avoid adulterated honey by purchasing it in the comb and carrying out himself the process of extracting the honey.

According to the conclusions stated in Table I, the following classification may be made of the samples described in it :—

Genuine	81
Doubtful	5
Adulterated	2
Adulterated with glucose syrup	6
Adulterated with cane sugar	5
Total number of samples	99

I have the honour to be, sir,
your obedient servant,

THOMAS MACFARLANE,
Chief Analyst.

Results of Analysis of 99 Samples

Date of Collection.	Number of Sample.	Name and Address of Vendor.	Name and Address of Manufacturer or Furnisher as given by Vendor or on the Label.	Quantity Collected.	Cost.	Brand or Description.
1903.		*District of Halifax.*			8 cts.	
April 16	20240	R. F. Guest, Yarmouth...	Parker & Eakins, Yarmouth	3 bottles..	0 30	.....
" 20	20263	R. B. Dakin, Windsor, N.S.	Brown & Webb, Halifax...	3 " ..	0 20	.....
" 21	20264	H. E. Wilson, Windsor...	Hattie & Mylius " ..	3 " ..	0 20	.....
" 28	20312	G. A. Burbridge, Halifax.	Brown & Webb " ..	3 " ..	0 30	.....
" 28	20313	Hattie & Mylius " ..	Vendors.....	3 " ..	0 45	.....
" 30	20322	R. McFatridge " ..	Hattie & Mylius, Halifax..	3 " ..	0 45	'Fine New Honey.'
" 30	20325	W. H. Stevens, Dartmouth	" " ..	3 " ..	0 30	.....
" 30	20328	E. Butcher " ..	Brown & Webb " ..	3 " ..	0 45	.....
May 1	20330	G. H. Caldwell, Halifax..	" " ..	3 " ..	0 40	.....
" 1	20333	Brown Bros. & Co. " ..	" " ..	3 " ..	0 45	.....
April 17	4317	G. E. Hughes, Charlottetown.	" " ..	3 " .	0 45	.....
" 17	4318	H. A. Ellis, Charlottetown	John Newson, Charlottetown.	3 " ..	0 38	.....
" 17	4327	G. A. Gourlie, Summerside	Henry Watson & Co	3 " ..	0 45	.....
" 17	4334	D. Gordon, Georgetown..	Evans & Son, Montreal...	3 " ..	0 45	.....
" 17	4340	A. McLean " ..	Dearborn & Co.....	3 " ..	0 60	.....
		District of New Brunswick.				
" 9	17854	Puddington & Merritt, 55 Charlotte St., St. John	E. L. Colpitt & Co., Petitcodiac, Pleasant Vale, Albert Co., N.B.	3 " ..	0 75	'Maple Leaf'.
" 11	17856	G. M. & A. A. Barker, 100 Princess St., St. John.	R. H. Smith, St. Thomas..	3 " ..	0 45	'Ontario Honey.
" 14	17867	Geo. A. Moore, 109 Brussel St., St. John.	Bottled by vendor from honey in bulk.	3 " ..	0 60	.....
" 17	17885	Francis McKay, 228 Main St., Moncton.	F. W. Fearman, Hamilton	3 " .	0 45	'Clover Honey
" 17	17886	Dr. E. O. Steves, 301 Main St., Moncton.	Canadian Drug Co., St. John.	3 " ..	0 45	.....
" 17	17887	Geo. Spencer, 272 Main St., Moncton.	" "	3 " ..	0 35	'White Clover Honey.'
" 17	17888	J. McD. Cook, 195 Main St., Moncton.	W. D. Black, Cloverdale Apiary. Truro, N.S.	3 " ..	0 75	'Extracted Clover Honey'
" 21	17896	Fred Waterson, 4 King St., St. Stephen.	Canadian Drug Co., St. John.	3 " ..	0 60	'Clover Honey
" 22	17904	" " ..	G. F. Beach, Charlotte Co., N.B.	3 " ..	0 60	.....
" 25	17916	W. A. Eastbrook, York St., Fredericton.	B. A. Goodspeed, York Co., N.B.	3 " ..	0 75	.....
		District of Quebec.				
" 16	23339	C. Peloquin, Notre Dame de St. Hyacinthe.	Vendor.....	3 lbs....	0 30	.....

of Honey as sold in 1903.

Results of Examination.			Observer.	Remarks by the Chief Analyst.	Number of Sample.
Direct Saccharimeter Reading.	Water.	Physical Characters.			
	p. c.				
– 9·0	24·6	Light yellow syrup, clear with pleasant smell.	Miss S. E. Wright.	Genuine	20240
– 7·3	24·0	Thick; strong beeswax smell, crystallised throughout.	"	"	20263
– 7·8	24·4	Clear syrup with sediment, strong beeswax smell.	"	"	20264
–32·2	17·0	Thick; crystallised throughout, strong beeswax smell.	"	"	20312
– 2·3	22·2	Deep yellow syrup, clear; beeswax smell; mild taste.	"	"	20313
–10·7	18·8	Deep yellow colour; clear; mild flavour.	"	"	20322
– 7·9	14·0	Somewhat thick; slightly smoky odour.	"	"	20325
–10·2	22·6	Yellow colour; one-half clear; the other crystallised; mild taste; beeswax odour.	"	"	20328
–10·7	19·2	Thick crystallised syrup; mild taste.	"	"	20330
–14·2	18·4	" " "	"	"	20333
–14·3	18·2	Light yellow colour; crystallised throughout.	Miss E. Davidson.		4317
– 9·0	18·0	Yellow; slightly crystallised ..	"	"	4318
–15·7	18·8	Light yellow; crystallized through out.	"	"	4327
–15·4	23·8	Yellow; slightly granulated or crystallised.	"	"	4334
–26·4	22·4	Yellow; partly crystallised....	"	Adulterated by addition glucose syrup.	4340
–16·9	22·0	Brown; partly granulated.. ..	"	Genuine...	17854
–15·0	19·4	Yellow; granulated throughout..	"	"	17856
– 9·0	20·6	" clear	"	"	17867
–17·0	21·6	" partly granulated	"	"	17885
–18·3	18·2	" "	"	"	17886
–15·7	27·4	Light yellow; clear; pleasant taste.	Miss S. E. Wright.	Doubtful..	17887
10·4	25·4	Light yellow; deposit on bottom and sides of jar; mild.	"	Genuine	17888
–13·3	25·6	Pale yellow; thick; very mild taste.	"	Doubtful..	17896
–15·8	24·6	Light yellow colour; deposit on bottom; strong beeswax smell; mild taste.	"	Genuine.	17904
–15·6	23·2	Yellow; slight froth on top; strong beeswax smell; mild taste.	"	"	17916
8·7	18·2	Bright yellow colour; clear; flower like flavour.	"		23389

RESULTS of Analysis of 99 Samples

Date of Collection.	Number of Sample.	Name and Address of Vendor.	Name and Address of Manufacturer or Furnisher as given by Vendor or on the Label.	Quantity Collected.	Cost.	Brand or Description.
1903.		*District of Quebec*—Con.			$ cts.	
April 22	23362	W. Campbell, St. Hyacinthe	W. Myers, White's Station	3 lbs.	0 30	
" 28	23372	L. S. Plamondon, South Durham.	Jos. Bissonnet, Valcourt	2½ "	0 30	
" 29	23378	O. Carigan et fils, Three Rivers, Que.	Le Rochefort, Bécancourt.	3¼ "	0 39	
May 1	23388	S. Jacques et fils, Terrebonne.	From farmer of Lachinail.	5 "	0 60	
April 30	23381	E. Goudron, Berthierville.	Vendor	3 "	0 30	White
" 30	23382	" "	"	3 "	0 30	Brown.
May 7	23391	Simeon Papillau, Notre Dame de St. Hyacinthe.	Antoine Marcil, Notre Dame de St. Hyacinthe.	2 5/16 "	0 23	
" 15	23604	J. B. St. Pierre, St. Hyacinthe.	Sœurs du Precieux Sang., St. Hyacinthe.	4½ "	0 65	
" 15	23605	J. B. Daignault & Cie, St. Hyacinthe.	C. Peloquin, Notre Dame de St. Hyacinthe.	3 "	0 30	
		District of Montreal.				
May 5	21296	H. Poirier, 1978 St. Catherine St., Montreal.		1 lb.	0 12	
" 5	21297	P. Daoust, 1830 St. Catherine St., Montreal.	Gunn, Langlois & Co	1 "	0 12	
" 5	21298	A. Fournier, 1879 St. Catherine St., Montreal.		1 "	0 12	
" 5	21299	G. De LaMothe, 1502 St. Catherine St. Montreal.		1 "	0 12	
" 5	21300	P. Massicotte & Co., 1470 St. Catherine St., Mont'l.	John Miller, Montreal.	2 jars	0 20	
" 8	21301	E. Limoyer, 1949 Notre Dame St., Montreal.		1 lb.	0 13	
" 14	21302	L. P. Lavoie, 3187 Notre Dame St., St. Cunég'de.	Hudon & Orsali, Montreal.	1 "	0 10	
" 14	21303	Robert & Frères, 229 Richelieu St., St. Cunégonde.		1 "	0 12	
" 14	21304	L. Legault, 102 Coursol St. St. Cunégonde.	L. P. Lavoie, St. Henri	1 "	0 10	
" 14	21305	W. J. Maloney, 468 St. Antoine St., St. Cunégonde.	Montreal Canning and Preserving Co.	3 jars	0 30	'Fine Honey Compound,' 'Banner Brand.'
		District of Kingston.				
April 30	23137	S. Fourt, Walton St., Port Hope.		1 bottle	0 20	
" 30	23139	D. F. McDonald, Pitt St., Cornwall.	W. Atchison, Cornwall	1½ lb.	0 27	
" 30	23140	W. A. Dunkin, Cornwall.	R. Atchison "	1 "	0 15	
" 30	23141	D. J. Gillies "	J. McNaughton, St. Raphaels.	1 "	0 10	
" 30	23142	" "	C. C. Farran, Farran's Pt.	3 jars	0 40	
" 30	23143	R. Nichols "		3 "	0 30	
" 30	23144	G. W. Armstrong "		1 lb.	0 11	
" 30	23145	J. E. Chevrier "		1 "	0 12	
" 30	23146	G. W. Runion, Marlboro' St., Cornwall.		1 "	0 10	
" 30	23138	J. Maybury & Co., Prescott.	Mrs. Robt. Johnson			

of Honey as sold in 1903—*Continued.*

Results of Examination.			Observer.	Remarks by the Chief Analyst.	Number of Sample.
Direct Saccharimeter Reading.	Water.	Physical Characters.			
°	p. c.				
—13·7	23·4	Brownish yellow; seven-eights of the bulk is granulated; smoky smell and taste.	Miss S. E. Wright	Genuine	23362
— 6·2	22·8	Yellow; clear; very strong beeswax smell.	"	"	23372
—12·2	22·6	Brown; clear; buckwheat taste and smell.	"	"	23378
—11·5	22·6	Light yellow syrup; thick; strong beeswax smell; mild taste.	"	"	23388
—12·5	20·0	Light brown colour; partly crystallised.	Miss E. Davidson	"	23381
—16·6	17·8	Brown; crystallised throughout: buckwheat taste.	"	"	23382
—15·7	19·2	Light yellow; crystallised throughout; smoky smell.	"	"	23391
— 5·8	19·0	Light yellow; crystallised throughout.	"	"	23604
—16·0	19·2	Yellow; crystallised almost throughout.	"	"	23605
14·3	20·0	Light yellow colour: crystallised throughout.	Miss E. Davidson	Genuine	21296
—16·5	19·2	Light yellow colour; crystallised throughout.	"	"	21297
15·5	19·2	Yellow; crystallised throughout; slight odour of smoke.	"	"	21298
—16·7	20·0	Light yellow; almost entirely crystallised.	"	"	21299
-16·6	25 0	Light yellow, clear; very sweet taste.	"	Doubtful	21300
— 6·0	32·6	Brown; partly crystallised; tastes of buckwheat.	"	Contains too much water.	21301
—15·8	21·0	Light yellow; crystallised throughout.	"	Genuine	21302
—18·5	20·8	Dark brown; crystallised; smells and tastes of buckwheat.	"	"	21303
—13·8	24·4	Dark brown; deposit at bottom; smells and tastes of beeswax.	Miss S. E. Wright.	"	21304
+83·0	28·8	Clear thin syrup; mild odour and not much taste of honey.	"	Adulterated by addition of glucose syrup.	21305
— 8·9	18·4	Pale yellow; granulated; flower-like flavour.	Miss S. E. Wright.	Genuine	23137
—11·1	14·6	Light yellow; granulated; pleasant taste and smell.	"	"	23139
—13·9	20·6	Light yellow; granulated; mild flavour.	"	"	23140
—15·1	19·2	" " " "	"	"	23141
—14·2	19·0	Yellow; clear; mild taste & smell.	"	"	23142
— 8·8	20·0	" granulated.	"	"	23143
- 7·9	23·8	Pale yellow; thick syrup; mild taste.	"	"	23144
—17·5	20·0	Yellow; partly crystallised	Miss E. Davidson.	"	23145
—13·9	19·0	" crystallised throughout.	"	"	23146
—11·2	24·2	" strong smell and taste of beeswax.	Miss S. E. Wright.	"	23138

Results of Analysis of 99 Samples

Date of Collection.	Number of Sample.	Name and Address of Vendor.	Name and Address of Manufacturer or Furnisher as given by Vendor or on the Label.	Quantity Collected.	Cost.	Brand or Description.
1903.		*District of Toronto.*			$ cts.	
April 15	23401	Chas. Chown, 575 Yonge St., Toronto.	Jones Bros., Niagara, Ont.	3 jars ...	0 27	
" 15	23402	R. English, 490 Yonge St., Toronto.	.....	3 " ...	0 25	
" 15	23403	F. Patience, 429 Yonge St., Toronto.	T. J. Dougall, Stouffville, Ont.	1 lb	0 15	
" 16	23404	J. M. Bothwell, Dunlop St. Barrie.	J. Gough, Crown Hill.....	1 " ...	0 10	
" 16	23405	James Vair, Dunlop St., Barrie.	.....	1 " ...	0 10	
" 16	23406	Hobley Bros., Dunlop St., Barrie.	W. J. Gough, Crown Hill.	1 " ...	0 13	
" 18	23102	J. T. Petrie, St. Paul St., St. Catharines.	H. Freas, St. Annes.....	1 jar....	0 40	
" 18	23101	J. T. Petrie, St. Paul St., St. Catharines.	Upton Co., Hamilton ...	3 jars ...	0 30	
" 17	23407	John O. Carpenter, M'ket Square, Hamilton.	.....	1 lb.....	0 20	
" 17	23408	C. H. Peebles, Market Square, Hamilton.	.....	1 " ...	0 15	
		District of Windsor.				
April 9	22047	C. A. Nairn, Goderich....	Mrs. Strachan, Goderich ..	3 jars ...	0 40	
" 16	22065	Stuebing Bros., Berlin ...	F. F. Dalley & Co., Hamilton.	3 " ...	0 30	
" 16	22069	A. K. Roesch, Waterloo..	F. W. Fearman, Hamilton.	1 lb.....	0 25	
" 17	22074	John Sloan & Co., Galt...	Mrs. Rose Miller	3 jars ...	0 35	
" 18	22080	J. A. McRae, Guelph.....	H. Walker & Sons, Guelph.	3 " ...	0 30	
" 22	22087	Wm. Anderson, Chatham.	Mr. Chrysler.....	3 lbs....	0 35	
" 22	22088	Hugh Malcomson " .	Amos Kelly, Co. Kent, Ont.	3 " ...	0 35	
" 22	22091	Geo. Parrot, Glencoe. ...	Wall & Gaffy, Windsor...	3 pots...	0 30	
" 22	22097	James Wilson, London ..	E. Bainard, Glenworth....	3 " ...	0 35	
" 22	22098	A. P. Yeo, London.	Vendor.....	3 " ...	0 30	
		District of Winnipeg.				
April 15	17430	Jas. Freeborn & Co., Morden.	Dundas & Flavelle, Lindsay, Ont.	1 lb	0 60	
" 18	17438	J. A. Munro, Boissevain..	Deadmaris, Brussels, Ont..	.....	0 75	
" 23	17448	R. W. McNaughton, Moosomin.	H. H. Waddell, St. Thomas, Ont.	3 jars....	1 05	
" 24	17449	A. Grant, Brandon.....	From a farmer.....	3 "	1 05	
" 25	17459	J. & E. Brown, Portage la Prairie.	Bright & Johnson, Winnipeg	3 "	0 75	
May 6	17464	W. B. Francis, Winnipeg.	Dyson, Gibson Co., Winnipeg.	3 "	0 60	
" 6	17467	J. G. Hargrave " .	Upton, Hamilton.....	3 "	0 75	
" 7	17469	Porter & Orris " ..	Dundas & Flavelle, Lindsay, Ont.	3 "	0 60	
" 7	17472	Campbell Bros. & Wilson, Winnipeg.	Vendors.....	3 "	0 60	

of Honey as sold in 1903—*Continued.*

Results of Examination.			Observer.	Remarks by the Chief Analyst.	Number of Sample.
Direct Saccharimeter Reading.	Water.	Physical Characters.			
	p. c.				
—15·9	21·4	Yellow; partly crystallised.....	Miss E. Davidson	Genuine.....	23401
—17·7	22·8	Light yellow, crystallised almost throughout.	—	.....	23402
—15·7	19·0	White; crystallised throughout and almost solid.	—	.....	23403
— 7·4	18·4	Yellow; slightly crystallised.. ..	—	.....	23404
— 1·9	22·2	Yellow; partly crystallised.....	—	.....	23405
—10·1	21·0	Light yellow; crystallised throughout.	—	.....	23406
—16·2	21·6	White; crystallised throughout..	—	.....	23102
+70·8	26·4	Yellow; clear.....	—	Adulterated by addition of glucose syrup and cane sugar.	23101
—11·4	22·4	White; crystallised throughout..	—	Genuine..... ...	23407
—14·2	20·6	" " " ..	—	.....	23408
—19·2	21·6	Yellow; partly crystallised.....	Miss E. Davidson	Genuine.....	22047
—17·0	20·8	" crystallised throughout.	"	.....	22065
— 7·0	19·2	" clear	"	.....	22069
—14·1	21·4	" partly crystallised.....	"	.....	22074
—20·0	21·2	" " "	"	.....	22080
—13·5	19·4	Light yellow; crystallised throughout.	"	.....	22087
—13·0	18·8	Yellow; partly crystallised.....	"	.....	22088
—12·0	19·8	" "	"	.....	22091
—14·8	21·4	Light yellow; crystallised throughout.	"	.....	22097
9·1	20·2	Yellow; crystallised throughout.	"	.....	22098
—14·5	21·2	Yellow; partly crystallised.....	Miss E. Davidson	Genuine.....	17430
+23·0	23·2	Dark yellow; clear	"	Adulterated by addition of cane sugar.	17438
—15·3	19·2	Yellow; crystallised throughout.	"	Genuine.....	17448
— 7·4	19·2	White; crystallised throughout..	"	.....	17449
+19·0	23·0	Brown; clear; smells of buckwheat.	"	Adulterated by cane sugar	17459
—11·6	25·6	Yellow; partly crystallised.....	"	Contains too much water.	17464
+49·1	27·4	Dark yellow: clear.....	"	Adulterated by addition of glucose syrup.	17467
—14·5	20·2	White; crystallised throughout..	"	Genuine	17469
+26·4	16·4	Brown; clear; very thick.....	"	Adulterated by addition of cane sugar.	17472

RESULTS of Analysis of 99 Samples

Date of Collection.	Number of Sample.	Name and Address of Vendor.	Name and Address of Manufacturer or Furnisher or given by Vendor or on the Label.	Quantity Collected.	Cost.	Brand or Description.
1903.		*District of Manitoba.*			$ cts.	
April 21	21711	Ouimette & Wallever, Red Deer.	J. Turner & Co., Hamilton	3 jars.	0 75	
" 23	21715	John West, Wetaskiwin..	" "	3 "	0 60	
" 24	21719	J. H. Morris & Co., Edmonton.	Dyson, Gibson Co., Winnipeg.	3 "	0 60	
" 25	21726	A. Davies, Strathcona....	" "	3 "	0 75	
" 29	21729	A. W. Ward, Calgary....	" "	3 "	0 60	
		District of British Columbia				
April 16	21686	A. T. Charleton, Port Haney.	Geo. Charleton, Ailsa Craig, Ont.	2 "	0 40	
" 16	21690	Coulter & Berry, Langley.	H. L. Johnson, Chilliwack	3 "	0 75	
" 16	21699	H. C. Henderson, Chilliwack.	A. Malcomson, Chilliwack.	3 "	0 75	
" 16	23503	Mrs. E. A. Farrer, Chilliwack.	G. A. Kipp, Chilliwack....	3 "	0 75	
" 21	23516	S. Petersky, Steveston....		3 "	0 90	
" 21	23520	E. Hunt, Steveston.....	San Diego Honey Co., San Francisco.	3 "	0 90	
" 21	23522	W. C. McBride, Port Guichon.	Pacific Const. Syrup Co., San Francisco.	3 "	1 00	
" 21	23523	Marshall Smith, Ladner's Landing.	Schilling Co., San Francisco	3 "	0 90	
" 25	23542	Speed Bros., Victoria.....	J. Reagh, Ladners's Landing.	3 "	0 75	
" 28	23549	E. J. Rae, New Westminster.	W. Ross, Ontario Co., California.	3 "	0 75	

of Honey as sold in 1903—*Concluded*

Results of Examination.			Observer.	Remarks by the Chief Analyst.	Number of Sample.
Direct Saccharimeter Reading.	Water.	Physical Characters.			
	p. c.				
—14·5	16·8	White; crystallised throughout.	Miss E. Davidson.	Genuine	21711
—11·0	18·8	White; crystallised almost throughout.	"	"	21715
—12·4	23·2	Yellow; partly crystallised	"	"	21719
+ 7·1	25·2	Yellow; clear	"	Adulterated by cane sugar	21726
+ 3·5	26·2	" "	"	" "	21729
—17·4	16·6	White; crystallised throughout	"	Genuine	21686
— 8·4	22·8	Yellow; partly crystallised; contains pieces of comb.	"	"	21690
+14·2	18·8	Brown; partly crystallised; very thick; tastes and smells of brown sugar.	"	Adulterated	21699
- - 8·2	19·0	Dark yellow or brown; crystallised almost throughout; contains pieces of comb.	"	Genuine	23503
+69·8	21·6	Yellow; partly crystallised; contains pieces of comb.	"	Adulterated with glucose syrup.	23516
+41·6	21·2	" " "	"	"	23520
+42·8	21·0	Yellow; slightly crystallised; contains pieces of comb.	"	"	23522
—14·8	17·0	White; crystallised throughout	"	Genuine	23523
—10·7	17·0	Yellow; partly crystallised	"	"	23543
—16·8	15·0	Brown; not crystallised; very thick.	"	"	23549

TABLE II.—Results of further examination of 13 samples Honey showing right handed rotation, by Miss. E. Davidson.

No. of samples.	By CLERGET PROCESS.				Approximate percentage of glucose syrup.	By FEHLING SOLUTION.			Dextrine reaction.
	Direct Saccharimeter reading.	Reading after Inversion.	Temperature Centigrade.	Cane sugar by Clerget formula; p. cent.		Reducing sugar, stated as invert.	Reducing sugar after inversion.	Cane sugar, per cent.	
4340	+27·4°	+21·3°	23°	4·65	13·7	62·68	68·04	5·09	Distinct.
21305	+81·0	+71·3	24	7·42	40·5	49·48	54·24	4·52	"
23101	+70·7	+39·3	24	24·02	35·3	40·15	62·60	21·33	"
17438	+22·9	—17·9	24	31·22	.....	42·98	80·08	35·26	None.
17459	+19·2	—16·5	24	27·31	.....	47·15	76·80	28·16	"
17467	+48·6	+35·2	24	10·24	24·3	52·98	63·00	9·52	Distinct.
17472	+26·8	—16·4	24	33·05	.....	45·69	78·75	31 41	None.
21726	+8·5	—15·2	24	18·13	.....	52·49	75·00	21.38	"
21729	+3·9	—14·7	23	14·18	.....	55·60	75·04	18·46	"
21699	+14·1	+10·8	21	2·49	.....	65·13	68·63	3·32	"
23516	+70·1	+55·4	23	11·20	35·0	55·51	65·72	9·70	Distinct.
23520	+41·9	+35·4	23	4·96	20·9	63·38	69·22	5·54	"
23522	+43·5	+32·2	23	8·61	21·7	62·60	70·00	7·11	"

MEMORANDUM REGARDING THE EXAMINATIONS REFERRED TO IN TABLE II.

The samples whose numbers are given in this table are those which shewed right handed rotation in the polariscopic observation noted in Table I, and which were subjected to further examination in order to ascertain whether this behavior was due to glucose syrup or cane sugar, and, in the latter case to determine the quantity of cane sugar present.

They were first examined by the Clerget process the nature of which is very clearly described by Allen (Commercial Organic Analysis, 1898; Vol. I, p. 260). The only difference which has been made in the equations there given is in the change by inversion which instead of 144 has been placed at 142·7 in accordance with the more recent determinations of Wohl. In Table II all the observations were given which are necessary for calculating the cane sugar, the percentage of which is also stated.

The percentage of sucrose present in the samples of Table II was also ascertained by the use of Fehling solution, the details of the process being as follows:—A five per cent solution of the honey sample was first prepared.

(1.) For determining the reducing sugars 10 c.c.m. of it, containing 0·5 grammes of the original sample were treated direct with Fehling solution in excess. The weight of the cuprous oxide produced multiplied by the factor 0·4861 and by 200 gave the percentage of reducing sugars present, stated as invert sugar. The name reducing sugar applies to all the varieties of this substance which act upon Fehling solution with precipitation of cuprous oxide. Dextrose, grape sugar, starch sugar, levulose or fruit sugar, the mixture of dextrose and levulose called invert sugar, and certain reducing substances which form in the syrup during the manufacture of sugar from the cane are all included under "reducing sugars." The term excludes cane sugar which does not act upon Fehl-

ing solution previous to inversion. The factor 0·4861 is based upon work done by Mr. F. W. Babington (Analyst, Vol. xvi., p. 181) and represents the cuprous oxide yielded by 1 gramme of invert sugar derived from inverting by dilute acid 0·95 grammes of cane sugar and precipitating by Fehling solution.

(2.) For ascertaining the quantity of cane sugar present 50 ccm. of the above mentioned five per cent solution of the honey were inverted by the action of 2 ccm. hydrochloric acid, then rendered slightly alkaline by potash solution and made up to 100 ccm. 10 ccm. of this inverted solution, containing 0·25 grammes of the original sample were then treated with excess of Fehling solution. The cuprous oxide produced multiplied by 400 and the factor 0·4861 gave the percentage of reducing sugar, including that derived from the inversion of the cane sugar present. The direct percentage, as ascertained under (1) was then deducted from the percentage after inversion, and the difference multiplied by 0·95 which gave the percentage of cane sugar in the sample. It will be seen from the table that the percentages thus obtained confirm, on the whole, with sufficient accuracy, those obtained by the Clerget process.

Allen states that, in the absence of added cane and invert sugar, an approximate estimation of the proportion of glucose syrup in honey may be made by reckoning 1 per cent of the adulterant for every degree of dextro-rotatory power possessed by the sample. Following this rule the percentage of glucose syrup present in the 13 samples of Table II are given in one of its columns.

The samples in question were also subjected to a qualitative test for dextrine which is usually a constituent of commercial glucose syrup. This test was applied in the manner described by Haenle (Die Chemie des Honigs : Strasburg, 1892), 5 ccm. of a 33⅓ per cent solution of the sample are placed in a test tube, and 2 ccm. of absolute alcohol gently added. If dextrine is present a white turbidity is observable at the contact plane of the two fluids, which is caused by the separation of the dextrine, and disappears on mixing. Cane sugar treated in this way, and honey as a rule do not give this reaction. In Table II a column is given which shows the results of this test when applied to the different samples.

APPENDIX E.

BULLETIN No. 91--WHITE LEAD IN OIL, 1903.

OTTAWA, Nov. 4, 1903.

W. J. GERALD, Esq.,
Deputy Minister of Inland Revenue.

SIR,—I beg to present this report regarding 147 samples of white lead in oil which, in accordance with your instructions of August 11 last, were collected in the various districts of the Dominion as follows :—

	Number of Samples.
Nova Scotia and P. E. Island	24
New Brunswick	16
Quebec	18
Montreal	15
Kingston	14
Toronto	16
London	14
Manitoba and North-west	18
British Columbia	12
Total	147

The table appended to this report gives the names under which these samples were sold, and the results of their examination in this laboratory, as well as the names of the vendors and furnishers of the samples. Besides ascertaining the absence of 'barytes,' the commercial name of the mineral, barite, finely ground, or its percentage when present, search was made for acid-soluble sulphuric acid and lime, in order to detect adulteration by sulphate of lime or by common whiting. These, it will be observed, were very seldom found, the chief adulterant being barytes. The table also gives in the remark column the conclusions drawn by myself from the results of the testing, according to which the total number of samples examined may be classified as follows :—

Genuine	100
Slightly impure	2
Adulterated, but not sold as pure	2
Adulterated, but sold under special names	25
Adulterated, sold as white lead	12
Prepared paints not sold as white lead	6
Total	147

In explanation of the foregoing it may be stated that the samples characterised as genuine are those which have been sold as pure in accordance with the provisions of the Act in restraint of fraudulent marking. This Act prohibits the use of the terms 'pure' or 'genuine,' for white lead in oil, unless the article has the composition specified in schedule A of the Act. The two 'slightly impure' samples were no doubt intended for genuine, and the very small amount of insoluble matter present was probably accidental. The two samples 'not sold as pure' have been called adulterated, although the

vendor showed good faith in making the declaration. The large number of samples sold under special names have been named 'adulterated' in accordance with former practice, and because their sale contravenes the spirit of the Adulteration Act, which defines an article as adulterated if 'any substance has been mixed with it so as to 'reduce, lower or injuriously affect its quality or strength.' Besides, the special names do not indicate the 'mixed' or 'compound' nature of these samples as required by the Act; neither do they declare to the purchaser that he is being served with an inferior article. Twelve samples were sold simply as white lead, but were largely adulterated, and were not labelled as 'compound' or 'mixture.' Finally, seven samples were purchased by the inspectors which were plainly declared to be 'paints' by the vendors and are known to be articles quite different in character from 'white lead in oil.'

I have the honour to be, sir,
Your obedient servant,

THOMAS MACFARLANE,
Chief Analyst.

RESULTS of examining 147

Date of Collection	Nature of Sample.	Number of Sample.	Cost. Quantity.	Cost. $ cts.	Name and Address of Vendor.
1903.	*District of Halifax.*				
Aug. 19..	Anchor, White Lead.....	4347	3 lbs.	0 30	W. A. Poole, Montague, P.E.I....
" 19..	White Paint, mixed ready for use.	4350	3 "	0 30	Capt. Jos. McDonald, Cardigan...
" 22..	London No. 1 White Lead Paint	4355	3 "	0 30	S.W. Crabbe, Charlottetown, P.E.I,
" 24..	White Lead.....	4359	3 "	0 27	Funnell & Chandler " ..
" 24..	"	4360	3 "	0 27	Cameron & Co. " ..
" 25..	Sheffield White (No. 1) Lead ..	4362	3 "	0 24	R. L. Holman, Summerside, P.E.I.
" 27..	London White Lead	4370	3 "	0 30	Matthew & McLean, Souris.....
" 27..	No. 1 White Lead	4374	3 "	0 30	Stanley, Shaw & Peardon, Charlottetown.
Sept. 14..	London No. 1 White Lead.....	20351	3 "	0 30	Stairs, Son & Morrow, Halifax, N.S.
" 14..	BB. No. 1 White Lead...	20353	3 "	0 30	H. H. Fuller & Co. " ..
" 14..	White Lead, not sold as pure..	20354	3 "	0 30	Black Bros. & Co. " ..
" 16..	"	20365	3 "	0 30	Martin & Moore " ..
" 16..	" sold as pure.	20366	3 "	0 30	D. Roche " ..
" 16..	" "	20367	3 "	0 30	F. Reardon " ..
" 16..	" "	20368	3 "	0 30	Walsh Bros. " ..
" 18..	" sold as Green Seal pure.	20369	3 "	0 30	R. Dawson & Sons, Bridgewater, N.S
" 18..	" sold as genuine....	20370	3 "	0 30	J. E. Kedy " ..
" 18..	" Can No. 023108 ..	20377	3 "	0 30	W. O. Bates " ..
" 19..	" Anchor brand....	20381	3 "	0 30	T. P. Calkin & Co., Kentville, N.S.
" 19..	" London No. 1.....	20382	3 "	0 30	B. H. Dodge " ..
" 22..	" 'London Lead'...	20385	3 "	0 30	W. B. Arthur & Co., Halifax, N.S.
" 22..	" sold as pure.....	20386	3 "	0 30	Wm. Robertson & Son " ..
" 22..	" sold as London No. 1.	20387	3 "	0 30	A. M. Bell & Co. " ..
" 22..	" Green Seal pure...	20388	3 "	0 30	Crowell Bros. " ..
	District of New Brunswick.				
Aug. 10..	Robertson's Warranted Chemically Pure Ground English White Lead.	17920	3 1-lb. tins	0 30	The Jas. Roberton Co. Ltd., St. Johns.
" 10..	London Genuine White Lead Paint.	17921	"	0 30	T. McAvity & Son, St. John, N.B.
" 19..	London White Lead, XX.....	17922	3 2-lb. tins	0 57	Kerr & Robertson " ..
" 19..	White Lead in Oil.....	17923	3 lbs. bulk	0 30	H. L. & J. T. McGowan .....
" 19..	" "	17924	"	0 30	W. M. Rowan, St. John, N.B.. ..
" 19..	" " Green Seal brand.	17925	"	0 30	H. A. Young " ...
" 25..	'Anchor' White Lead, superfine	17940	3 1-lb. tins	0 30	Sussex Mercantile Co. Ltd., Sussex.
" 26..	White Lead in Oil.....	17943	"	0 30	Winter Co., Moncton, N.B.....
" 26..	" "	17944	"	0 30	TheSumner Co. Ltd., Moncton, N.B.
" 29..	'Anchor' White Lead in Oil...	17952	4 lbs. bulk	0 40	H. M. Kent, Bathurst, N.B. .....
Sept. 8..	Pure White Lead	17960	3 1-lb. tins	0 30	Dinsmore Bros., St. Stephen, N.B.
" 9..	White Lead in Oil...	17965	4 lbs. bulk	0 40	G. M. Taylor, Grand Falls, N.B...
" 11..	" "	17968	"	0 40	A. E. Jones, Woodstock, N.B.....
" 11..	" "	17969	"	0 40	W. F. Dibblee & Son, Woodstock..
" 12..	'Green Seal' White Lead	17971	3 2-lb. tins	0 60	Tweedale & Co., Fredericton, N.B.
" 12..	White Lead, not sold as pure..	17972	3 1-lb. tins	0 36	R. Chestnut & Son, Fredericton ...

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Samples of White Lead in oil.

Name and Address of Manufacturer or Furnisher.	Residue insoluble in Nitric Acid. Barytes in most cases.	Sulphuric Acid.	Lime.	Name of Analyst.	Remarks by the Chief Analyst.
	p. c.				
Henderson & Potts, Halifax, N.S.	25·60	Trace.	Trace.	Miss S. E. Wright	Adulterated.
Blundell, Spence & Co., Hull and London, Eng.	86·55	None.	None.	"	Sold as prepared paint.
Henderson & Potts, Halifax, N.S.	42·85	Present.	Present.	"	Adulterated.
Canada Paint Co. Ltd., Montreal.	14·20	None.	None.	"	"
A. Ramsay & Son "	None.	"	"	"	Genuine.
Sheffield Lead and Colour Works.	39·35	"	"	"	Adulterated.
Henderson & Potts, Halifax, N.S.	25·90	"	"	"	"
P. D. Dodds, Montreal, Que...	None.	"	"	"	Genuine.
Henderson & Potts, Halifax, N.S.	41·50	"	Distinct traces.	Miss E. Davidson	Adulterated.
" "	40·00	"	"	"	"
Motley & Co., Dartmouth, N.S.	47·55	"	"	"	Adultera'd, although not sold as pure.
Burrell & Co., London	None.	"	None.	"	Genuine.
A. Ramsay & Son, Montreal, Que.	0·05	"	"	"	"
Baylis "	None.	"	"	"	"
A. Ramsay & Son "	0·10	"	"	"	"
Sherman-Williams, Chicago	0·05	"	"	"	"
Henderson & Potts, Halifax, N.S.	None.	"	"	"	"
Montreal Rolling Mills Co.....	"	"	"	"	"
Henderson & Potts, Halifax, N.S.	24·80	"	Traces.	"	Adulterated.
Stairs, Son & Morrow " ..	39·80	"	"	"	"
Henderson & Potts " ..	50·65	"	"	"	"
R. C. Jamieson & Son, Montreal.	None.	"	"	"	Genuine.
Henderson & Potts, Halifax, N.S.	38·85	"	Distinct traces.	"	Adulterated.
Sherwin-Williams, Chicago.....	None.	"	None.	"	Genuine.
The Jas. Robertson Co. Ltd., St. John.	"	"	"	Miss S. E. Wright	"
Henderson & Potts, Halifax.....	"	"	"	"	"
" "	46·95	"	"	"	Adulterated.
The Jas. Robertson Co. Ltd., St. John.	None.	"	"	"	Genuine.
The Canada Paint Co., Montreal.	"	"	"	"	"
The Sherwin-Williams Co. "	"	"	"	"	"
Henderson & Potts, Halifax and Montreal.	26·05	"	"	"	Adulterated.
A. Ramsay & Son, Montreal.....	56·50	"	"	"	"
The Jas. Robertson Co. Ltd., St. John.	None.	"	"	"	Genuine.
Henderson & Potts, Halifax.....	"	"	None.	"	Adulterated.
Baylis Manufacturing Co., bought out by R. C. Jamieson & Co., Montreal.	"	None.	"	"	Genuine.
Sherwin-Williams & Co., Montreal	"	"	"	"	"
Canada Paint Co., Montreal.....	"	"	"	"	"
Henderson & Potts, Halifax.....	"	"	"	"	"
Sherwin-Williams & Co., Montreal	"	"	"	"	"
Canada Paint Co., Montreal.....	52·40	Present.	3·00	"	Adultera'd, although not sold as pure.

RESULTS of examining 147

Date of Collection	Nature of Sample.	Number of Sample.	Cost.		Name and Address of Vendor.
			Quantity.	$ cts.	
1903.	*District of Quebec.*				
Aug. 28..	White Lead, guaranteed pure, Assn. No. 955292.	23606	3 lbs. bulk	0 24	Jos. Langlois, Rimouski, Que.....
" 29..	"	23611	3 "	0 20	Tancrède Peltier, Rivière du Loup.
" 29..	"	23612	3 "	0 20	" "
" 31..	Island City Pure Prepared House Paint—Inside white.	23618	3-lb. tins..	0 30	A. Normand, Montmagny.....
Sept. 1..	White Lead	23621	3 lbs. bulk	0 20	Carrière, Laine et Cie, Lévis. .....
" 1..	" guaranteed pure..	23623	3 "	0 24	J. U. Laine, Lévis.....
" 2..	" guaranteed pure, Assn. No. 085880.	23627	3 "	0 25	U. Lemieux et fils, Quebec.....
" 2..	" guaranteed pure, No. 999049.	23628	3 "	0 21	L. C. Giguère, Quebec. .....
" 3..	Pure White Lead..... ...	23629	3 lbs.....	0 30	Blais & Huard, Thetford, Que.....
" 4..	Pure White Lead, Association Label No. 26947.	23632	3 "	0 21	Geo. Lamoureux, Weedon, Que....
" 5..	Pure White Lead 'Satin White,' Government standard.	23635	3 lbs. bulk	0 30	W. E. Webster & Son, Coaticooke, Que.
" 5..	Pure White Lead, Association Label 903136.	23636	3 "	0 25	C. A. Kennedy, Coaticooke, Que...
" 15..	White Lead, guaranteed chemically pure, for decorators...	23640	3 "	0 24	W. Chartrand, Ste. Rose, Que.....
" 15..	Bull Dog, Pure Liquid Paint..	23642	3 1-lb. tins	0 27	G. H. Hill, Lachute, Que.....
" 15..	White Lead	23644	3 lbs. bulk	0 18	McFaul Bros., Lachute Mills.....
" 15..	" Label No. 53040...	23645	3 "	0 30	J. R. Meikle & Co., Lachute .....
" 17..	Pure White Lead.....	23646	3 "	0 20	S. G. Laviolette, St. Jerome.....
" 17..	Pure White Lead, Association Label 840523.	23647	3½ lbs.....	0 25	Bruno Beaulieu, " .....
	District of Montreal.				
Aug. 22..	White Lead, marked pure.....	21361	3 lbs. bulk	0 24	S. J. Granger, 679 St. Catherine St., Montreal.
" 24.	" " ...	21362	3 "	0 24	S. L. Lafleur, 1932 Notre Dame St., Montreal.
" 24..	" "	21363	3 "	0 18	Sauve & Dagenais, 2044 Notre Dame St. Montreal.
" 24..	" "	21364	3 "	0 24	P. Demers et fils, 2193 Notre Dame St., Montreal.
" 25..	White Lead, warranted chemically pure, Association Label 24437.	21366	3 lbs ...	0 30	A. Leroux, 2344 Notre Dame St., Montreal.
" 25..	Elephant Brand White Lead, Genuine, Association Label 962448.	21367	3 "	0 24	G. Prudhomme, 174 Centre St., Montreal.
Sept. 14..	White Lead 'Pure'	21368	3 "	0 18	Watts & Malkivot. 1031 Ontario St., Montreal.
" 14..	" "	21369	3 "	0 18	" " "
" 14..	" " No. 28573.	21370	3 "	0 24	O. Leblanc, 1118 Ontario St., Montreal.
" 15..	" 'Genuine,' No. 998396	21371	3 "	0 38	A. A. McMartin. St. Joseph St., Lachine.
" 15..	" 'Pure,' No. 066394.	21372	3 "	0 20	W. E. Ranger, Lachine .....
" 16..	" " No. 912246..	21373	3 "	0 24	Joseph St. Marie, 1 St. Catherine St., Montreal.
" 16..	" No. 938839.....	21374	3 "	0 21	John Miller & Son, 1325 St. Catherine St., Montreal.
" 16..	" 'Pure'	21375	3 "	0 21	F. Martineau. 1381 St. Catherine St., Montreal.
" 16..	" "	21376	3 "	0 24	N. Desjardins, 1560 St. Catherine St., Montreal.

SESSIONAL PAPER No. 14

Samples of White Lead in Oil—*Continued.*

Name and Address of Manufacturer or Furnisher.	Residue insoluble in Nitric Acid. Barytes in most cases.	Sulphuric Acid.	Lime.	Name of Analyst.	Remarks by the Chief Analyst.
	p. c.	p. c.	p. c.		
A. Ramsay & Son, Montreal. . .	None.	None.	None.	Miss E. Davidson	Genuine.
Dodds & Co., Montreal.	"	"	"	"	"
Baylis Manufact'g Co., Montreal	2·20	"	"	"	Slightly impure.
P. D. Dodds & Co., Montreal. . . .	2·00	Present.	Present.		Sold as prepared paint.
Canada Paint Co. "	None.	None.	None.	"	Genuine.
P. D. Dodds & Co. "	1·00	"	"		Slightly impure.
Canada Paint Co. "	0·40	"	"		Genuine.
" " . . .	None.	"	"		"
The London Paint Co., sold by Henderson & Potts.	44·75	Present.	Trace.		Contains much oil and is probably a prepared paint.
Montreal Rolling Mill Co., Montreal.	None.	None.	None.	"	Genuine.
The Jas. Robertson Co., Montreal	0·05	"	"	"	"
Baylis Manufacturing Co.	0·25				
A. Couillard, Montreal.	None.	"			"
A. Ramsay & Son, Montreal. . .	0·40		22·06		Sold as prepared paint.
Canada Paint Co. " . . .	0·35	"	11·20		Adulterated.
" "	None.		None.		Genuine.
P. D Dodds, " . . .					"
Canada Paint Co. "	0·05				
P. D. Dodds & Co., Montreal . . .	None.	None.	None.	Miss S. E. Wright	
Jas. Robertson & Co. "	"			"	
Baylis Manf'g. Co. " . .		"			
P. D. Dodds & Co. . . .				"	"
Montreal Rolling Mills Co., Montreal.		"			
Canada Paint Co., Montreal. . . .					"
P. D. Dodds & Co. " . . .	"				
C. R. McDowell, " . . .	"	"	Trace.		
Baylis Manuf'g. Co. " . . .	"	"	None.		
Canada Paint Co. "	"	Present.	Present.	"	
Montreal Rolling Mills Co. " . . .		None.	None.	"	
" " . .	"	Present.	Present.	"	"
Canada Paint Co., Montreal.	"	None.	None.	"	"
Vendors.	"	"	"	"	"
P. D. Dodds & Co., Montreal. . . .	"	"	"	"	"

RESULTS of examining 147

Date of Collection	Nature of Sample.	Number of Sample.	Cost. Quantity.	Cost. $ cts.	Name and Address of Vendor.
1903.	*District of Kingston.*				
Aug. 26..	White Lead, Pure	21418	3 lbs. bulk	0 20	Cameron & Leacock, Smith's Falls.
" 26..	" Genuine, Assn. Stamp No. 11024	21419	3 "	0 20	Clarke & Lewis, Smith's Falls.....
" 27..	" Genuine, Assn. Label No. 061159	21420	3 "	0 24	R. F. Smart, King St., Kingston ..
" 27..	" Pure, Assn. Label No. 060042,	21421	3 "	0 21	A. G. Dobbie & Co., King St., Kingston.
" 27 .	" Genuine, Assn. Label No. 06102.	21422	3 "	0 24	B. D. Steacy, King St., Kingston..
" 27..	" Assn. Label 044620	21423	3 "	0 21	R. W. Ross & Co., King St., Prescott
" 27..	" " 986294.	21424	3 "	0 21	N. Willard, King St., Prescott....
" 28.	" Genuine..... ...	21425	3 "	0 24	Jarvo & Co., Pitt St., Cornwall....
" 28..	" Warranted Pure.	21426	3 "	0 24	" " ....
" 28..	" Genuine, Label No. 001795.	21427	3 "	0 40	G. R. Phillips " ...
Sept. 1..	Government Standard, Pure White Lead.	21430	3 "	0 20	A. E. H. Braithwaite, Gananoque, Ont.
" 1..	Pure White Lead.....	21431	3 "	0 20	L. W. Bennett & Son, Gananoque, Ont.
Aug. 31..	" Assn. No. 860504	21428	3 "	0 21	W. A. Mitchell, Kingston, Ont....
" 31..	" " 043667	21429	3 "	0 30	Jno. Corbett " ....
	District of Toronto.				
Sept. 2..	White Lead, Unicorn Brand, Pure, Label No. 47554.	23241	3 lbs.....	0 24	F. Hamilton, Hamilton.. .....
" 2..	White Lead, Genuine, Label 92160.	23242	3 "	0 21	Thos. Ramsay, Market Place, Hamilton.
" 2..	" Pure	23243	3 " ...	0 24	Parke & Parke, Hamilton.....
" 2 .	" " No. 067775..	23244	3 "	0 18	H. A. Webber, King St., Hamilton.
" 3..	" " No. 925651..	23245	3 " ...	0 24	W. W. Lake, 608 Queen W., Toronto
" 3..	" "	23246	3 tins. ...	0 28	A. Maas, 534 Queen W., Toronto..
" 4..	" Absolutely Pure, No. 861136.	23233	3 lbs.....	0 24	W. F. Cockshutt & Co., Brantford.
" 4..	" Pure	23247	3 "	0 24	Howie & Feely, Brantford .....
" 4..	" Chemically Pure.	23248	3 "	0 24	" " .....
" 4..	" Assn. No. 030724.	23249	3 " ...	0 20	John Bishop & Son " .....
" 4..	" Pure	23250	3 "	0 24	T. O. Noble " .....
" 5..	" "	23252	3 "	0 24	Russil Hardware Co., 126 King East, Toronto.
" 5..	" Absolutely Pure, No. 049198.	23253	3 "	0 30	Thos. Meredith & Co., 156 King St. East.
" 5.	" Genuine.....	23254	2 tins.....	0 24	J. J. Murray, 224 Yonge St., Toronto
" 5 .	" Decorators' Pure.	23255	3 lbs.....	0 30	Geo. Pearsall, 417 " .
" 5.	" Label No. 892299.	23251	3 " . .	0 24	T. A. Noble, Brantford .....
	District of London.				
Aug. 20..	White Lead, Absolutely Pure..	22110	3 lbs.....	0 21	Harland Bros., Clinton, Ont.. . ..
" 20..	" Elephant Brand .	22112	3 "	0 21	Charles C. Lee, Goderich, Ont ....
" 21..	Decorators' Pure White Lead..	22115	3 "	0 25	Sills & Mundy, Seaforth, Ont.....
" 21..	Percy's Extra Standard White Lead.	22116	3 "	0 24	Chesner & Smillie " .....
" 24..	White Lead, Chemically Pure.	22120	3 "	0 21	J. G. Moser, Blyth, Ont .....
" 24..	Genuine White Lead.....	22123	3 "	0 21	W. F. A. Fishlugh, Wingham, Ont
" 24..	Robertson's Pure White Lead..	22124	3 "	0 20	J. D. Burns, Wingham, Ont . ....
" 25.	White Lead	22127	3 "	0 25	A. & J. Mucklejohn, Harrison.....
" 25..	"	22134	3 "	0 25	H. A. Havill, Walkerton, Ont.....
" 26..	"	22139	3 "	0 25	Skelton, Lundy & Co., Palmerston, Ont.

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Samples of White Lead in oil—*Continued.*

Name and Address of Manufacturer or Furnisher.	Residue insoluble in Nitric Acid. Barytes in most cases.	Sulphuric Acid.	Lime.	Name of Analyst.	Remarks by the Chief Analyst.
	p. c.	p. c.	p. c.		
P. D. Dodd & Co.	None.	None.	None.	Miss E. Davidson	Genuine.
Canada Paint Co.	0·25	"	"		
"	None.	"	"		
Montreal Rolling Mills Co.	0·10				
Canada Paint Co.	0·05				
Baylis Manufacturing Co.	None.				
" "	"		"		
Henderson & Potts	"	"			
"	"	"	"		
Canada Paint Co.	"	"			
Francis Frost & Co.	0·10		"		
James Robertson & Co.	0·05				
A. Ramsay & Son, Montreal.	None.	"	"		
Montreal Rolling Mills Co.	"	"			
	0·05	None.	None.	Miss E. Davidson	Genuine.
Canada Paint Co.	None.	"			
P. D. Dodd & Co.	0·80				
A. Ramsay & Son.	0·20	"			
Canada Paint Co	None.	"	"		
Globe Paint Co.	24·10	"	"		Adulterated.
Ontario Lead and Wire Co.	None.	"			Genuine.
P. D. Dodds & Co	"	"			
Dominion Lead Works, Toronto.	"	"	"		
A. Ramsay & Son.	"				
P. D. Dodd & Co.	0·05	"			
Ontario Lead and Wire Co.	None.	"			
" "	"		"		
Canada Paint Co.	0·05	"			
Francis Frost & Co	0·10	"			
Canada Paint Co.	None.				
Somerville & Co., Lead and Wire Co., Toronto.	0·15	None.	None.	Miss E. Davidson	Genuine.
Canada Paint Co., Montreal and Toronto.	0·10	"	"		
P. D. Dodd & Co.	0·10	"	"		
Sanderson Pearcy & Co., Toronto	21·15		"		Adulterated.
James Robertson & Co., Toronto.	None.	"	"		Genuine.
Canada Paint Co., Montreal.	0·05	"	"		
James Robertson & Co., Toronto.	0·10	"	"		"
A. Ramsay & Son, Montreal.	0·05	"	"		
Sanderson, Percy & Co., Toronto.	45·75	"	"		Adulterated.
James Robertson & Co., Toronto.	0·05	"	"		Genuine.

RESULTS of examining 147

Date of Collection	Nature of Sample.	Number of Sample	Cost. Quantity.	Cost. $ cts.	Name and Address of Vendor.
1903.	*District of London*—Con.				
Sept. 1..	Decorators' Pure White Lead ..	22144	3 lbs.....	0 24	John Fennell & Sons, Berlin, Ont..
" 1..	Pure White Lead, Government Standard.	22147	3 "	0 21	Liphardt Bros., Waterloo, Ont ....
" 2..	White Lead	22149	3 "	0 21	W. J. McMurtry, Galt, Ont.....
" 2..	"	22156	3 "	0 21	C. Kloper, Guelph, Ont.....
	District of Winnipeg.				
Aug. 20..	White Lead	17482	3 cans.....	0 30	E. Cronter, Gladstone, Man.....
" 21..	"	17486	3 "	0 45	Babb & Kirkland, Portage la Prairie
" 21..	Maple Leaf White Lead.	17488	3 lbs.....	0 45	Brown & Armstrong, Carberry, Man.
" 25..	No. 1 White Lead	17496	3 "	0 45	Frame & Miller.....
" 28..	Superfine White Lead.....	23702	3 "	0 45	Robt. Wyatt, Winnipeg, Man. ..
" 28..	Green Seal White Lead.....	23703	3 "	0 45	Graham & Rolston .....
28..	White Lead.....	23704	3 "	0 30	W. A. Templeton.....
" 28..	Superfine White Lead..... ..	23705	3 "	0 30	Leon Abranovich, Winnipeg.....
" 28.	White Lead....	23706	3 "	0 40	Watt & Gordon " .....
" 28..	Superfine White Lead.. . ..	23707	3 "	0 45	Campbell & Son " ..
" 28..	White Lead..... ..	23709	3 "	0 30	Allaire & Bleau, St. Boniface..
.. ..	"	23721	3 "	0 45	J. H. Ashdown, Winnipeg .....
Sept. 8..	"	21745	5 "	0 45	Tostier & Co., general store, Red Deer, Alberta.
" 9..	"	21749	3 "	0 45	Peterson & Anderson, hardware, Wetaskiwin.
" 10..	"	21751	3 "	0 30	F. M. Gray, Edmonton.....
" 11..	"	21756	3 "	0 40	W. E. Ross, hardware, Strathcona.
" 15..	"	21764	3 "	0 30	T. R. Stewart, hardware, Calgary.
" 15..	"	21765	3 "	0 25	J. H. Ashdown, Calgary..... ..
	District of British Columbia.				
Aug. 25..	Island City Pure Prepared House Paints—Inside White.	23559	3 cans.....	0 45	R. Mackay, Vancouver, B.C ...
" 25..	Stag Brand Liquid Paint.....	23564	3 "	0 45	J. Main " .....
" 26..	White Lead, chemically pure..	23565	12½ lbs....	0 90	Robertson Godson Co., Vancouver.
" 26..	Extra Warranted White Lead.	23566	12½ " ...	0 85	" " " ..
" 27..	Exterior White Lead...	23567	12½ " ...	1 25	Fyfe & Hunter, Vancouver.....
" 27..	Decorator's Pure White Lead..	23568	13 " ...	0 95	P. D. Dods & Co. " .....
" 27..	Bulldog Pure White Lead.....	23569	14½ " ...	1 45	Fyfe & Hunter " .....
" 28..	Special Decorator's White Lead	23570	13 " ...	0 90	P. D. Dods & Co. " .....
" 29..	No. 1 White Lead	23571	13 " ...	0 90	" " .....
Sept. 10..	White Lead....	23593	3 cans.....	0 75	Wood, Vallant & Leggatt, Vancouver.
" 10..	London White Lead	23594	3 "	0 75	McLennan-McFeeley, Vancouver..
" 10..	No. 1 White Lead	23595	3 "	0 50	P. D. Dods & Co., Vancouver .....

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Samples of White Lead in Oil—*Concluded.*

Name and Address of Manufacturer or Furnisher.	Residue insoluble in Nitric Acid. Barytes in most cases.	Sulphuric Acid.	Lime.	Name of Analyst.	Remarks by the Chief Analyst.
	p. c.				
P. D. Dodd & Co.	None.	None.	None.	Miss E. Davidson . .	Genuine.
Elliott & Co., Toronto. . . .	0·05	"	"	" . . .	
A. Ramsay & Son, Montreal. . . .	20·75	"	"	"	Adulterated.
Montreal Rolling Mills Co. . .	None.	"	"	" . .	Genuine.
British North America Colour Co.	44·25	"	"	"	Adulterated
. . . . .	58·45	"	"	" . .	"
G. F. Stephens & Co., Winnipeg.	46·30	"	"	" . .	"
. . . . .	38·30	"	"	"	"
. . . . .	39·40	"	"	"	"
The Sherwin-Williams Co.	None.	"	"	"	. . . Genuine.
St. Lawrence Colour Wotks.	43·50	"	"	"	. . . Adulterated
G. F. Stephens, Winnipeg. . .	39·25	"	"	"	. . .
British North America Colour Co.	10·70	"	"	"	"
G. F. Stephens, Winnipeg. . . .	37·75	"	"	"	. . "
Canada Paint Co.	None.	"	"	"	. . Genuine,
British North America Colour Co.	63·50	"	"	"	Adulterated
G. F. Stephens, Winnipeg. . . .	0·05	"	"	"	Genuine.
Canada Paint Co., Montreal.	0·10	"	"	" . . .	"
A. Ramsay & Son, Montreal.	0·05	"	"	"	"
Sherwin-Williams Co., Montreal.	0·05	"	"	"	"
A. Ramsay & Son, Montreal. . . .	None.	"	"	"	"
Canada Paint Co., Montreal. . . .	"	"	"	"	"
P. D. Dods & Co., Montreal . . .	10·55	None.	Trace.	"	. . Sold as prepared paint.
Canada Paint Co., Montreal.	0·40	Present.	14·72	"	. . . "
Dominion Lead Works, Toronto. .	None.	None.	None.	"	. . . Genuine.
" " " . .	23·70	"	"	"	. Adulterated.
A. Ramsay & Sons, Montreal. . . .	39·15	"	"	"	. . . "
P. D. Dods & Co., Montreal	None.	"	"	"	. . . Genuine.
W. Johnson, Dickson & Co., Montreal.	"	"	"	"	. . . "
P. D. Dods & Co., Montreal	27·05	"	Trace.	"	. . . Adulterated.
" " "	34·60	"	"	"	. . . "
British North America Paint Co., Victoria.	61·00	"	"	"	. . . "
A. Ramsay & Co., Montreal.	39·40	"	9·40	"	. . .
P. D. Dods & Co., Montreal	44·45	"	None.	"	. . .

APPENDIX F.

BULLETIN No. 92--DISTILLED LIQUORS.

OTTAWA, November 25, 1903.

W. J. GERALD, Esq.,
Deputy Minister of Inland Revenue.

SIR,—I beg to transmit herewith inclosed a report by Mr. McGill on the samples of distilled liquors which were collected in accordance with your instructions of August 11 last. The report is accompanied by a tabulated statement which describes the origin of the samples and the results obtained in their examination.

I am, sir, your obedient servant,

THOMAS MACFARLANE,
Chief Analyst.

OTTAWA, October 31, 1903.

THOMAS MACFARLANE, Esq., F.R.S.C., &c.,
Chief Analyst.

SIR,—I beg to hand you my report on 216 samples of liquors. These consist of the following :—

Rye whiskey	91	Samples.
White "	30	"
Scotch "	24	"
Irish "	2	"
Gin	27	"
Rum	12	"
Brandy	30	"
	216	"

No deleterious substances have been found in any of these samples.

In accordance with special instructions, I have made examination for alkaloids in all whiskey samples having less than 75 per cent proof strength. A negative result was obtained in every case.

The principal adulterant is water. In order to enable me to say whether or not a sample may be styled 'adulterated' from dilution with water, it is necessary to recognize some standard strength for alcohol. The British 'Sale of Food Amendment Act' of 1879 fixed the minimum limit strength for gin at 65 per cent, and that for brandy, rum and whiskey at 75 per cent of proof spirit.

Although these limits are not legally recognized in Canada, I have used them (in the absence of any other standard) for purposes of comparison.

The following summary will show, at a glance, the result of their application :—

Kind.	Total Number of Samples.	Above Standard Strength.	Below Standard Strength.	Percentage.	
				Above.	Below.
Rye whiskey	91	25	66	27·5	72·5
White "	30	5	25	17·0	83·0
Scotch "	24	22	2	92·0	8·0
Irish "	2	2	0	100·0	0·0
Gin	27	19	8	70·0	30·0
Rum	12	11	1	92·0	8·0
Brandy	30	25	5	83·0	17·0

From this table it appears that the liquors most tampered with are those which are most in demand, viz :—whiskey (rye and malt) and gin.

The last examination of liquors of this character made by me was in 1891 ;* and it is interesting to compare the results then obtained with those shown in the above table. This I have done in the subjoined table, where percentage numbers are used.

Kind of Liquor.	Collection of 1903.			Collection of 1891.		
	Number Examined.	Above Standard.	Below Standard.	Above Standard.	Below Standard.	Number Examined.
Rye whiskey	91	27·5	72·5	23·0	77·0	61
White "	30	17·0	83·0	12·0	88·0	33
Scotch "	24	92·0	8·0	77·0	23·0	22
Irish "	2	100·0	0·0	80·0	20·0	10
Gin	27	70·0	30·0	100·0	0·0	19
Rum	12	92·0	8·0	86·0	14·0	13
Brandy	30	83·0	17·0	84·0	16·0	24

Except in the case of gin and brandy the above comparison shows a decided improvement in the quality of these spirits in the interval of twelve years. Gin shows a noteworthy falling off in spirit strength.

The term 'spirit gravity' is used in the tables to signify the gravity which the liquor would have, provided that nothing else than alcohol and water were present. Of course the original gravity of the liquor is always higher than the spirit gravity, from the presence in it of matter in solution (sugar, caramel, tannins, glycerine, &c.) having a density higher than water.

In calculating the percentage of alcohol (and proof spirit) from the 'spirit gravity,' the tables of O. Hehner have been used. These tables are sanctioned by the excise regulations of our own country, as well as in England, Germany and elsewhere.

I may add that the furfurol test, and the production of a distinct turbidity (opalescense) on addition of water to the distillate, are the chief means we possess for discriminating between a liquor which has been produced by direct distillation from the 'mash,' and one which has been manufactured by reducing rectified spirit with water to the desired strength, and further addition of flavouring or colouring matter. Scotch and Irish whiskies, gin, rum and brandy are liquors of the first type (sometimes spoken of as pot-still spirits). Rye whiskey and white whiskey (malt whiskey) are usually manufactured from rectified spirit.

Fuller details regarding this aspect of the question are given in Bulletin 27 of this series.

I have received valuable assistance in carrying out this investigation from Mr. Lemoine and Mr. Valin.

I have the honour to be, sir, your obedient servant,

A. McGILL.

* Bulletin 27.

INSPECTION OF RYE WHISKEY—

Date of Collection	Nature o Sample.	Name and Address of Vendor.	Name and Address of Manufacturer or Furnisher.	Number of Sample.
Aug. 27	Rye Whiskey	M. J. Foley, Souris, P.E.I	Sullivan & Co., St. John, N.B.	4371
Sept. 8		Kelley & Glassey, Halifax, N.S.	Gooderham & Worts, Toronto, Ont.	20335
" 9		J. Hogan, Halifax, N.S	Unknown	20340
" 19		J. McIntosh, Kentville, N.S.	H. Walker, Walkerville	20383
Aug. 22	'Imperial'	Henry Finnegan, St. John, N.B	" "	17938
" 24	'Seagram's Canadian.'	McIntyre & Comeau "	Seagram Distillery, Waterloo, Ont.	17939
" 25		C. H. Fairweather, Sussex, N.B.	H. Corby, Belleville, Ont	17942
" 26		P. Gallagher, St. John, N.B	Wm. Marshall, Hamilton, Ont	17948
Sept. 8		Frank Smith, St. Stephen, N.B.	H. Walker & Sons, Walkerville, O.	17961
" 10		P. D. Bourgoin, Grand Falls, N.B.	" "	17967
Aug. 28		A. Caron, Rimouski	Wiser, Prescott, Ont	24503
" 29		J. W. Anctil, Rivière du Loup	N. Rioux, Quebec	24505
" 31		Damiens & Cie. "	J. Baillargeon, Quebec	24507
" 31		Tetû Frères, Montmagny, Que	H. Walker, Walkerville	24508
Sept. 1		A. G. Lambert, Lévis, Que	Whitehead & Turner, Quebec	24510
" 1		A. W. Couture "		24512
" 3		J. H. Lessard, Thetford, Que	Walker's	24516
" 5		A. Trudeau, Coaticook, Que	"	24518
" 16		Alex. Berriquer, Lachute Mills	F. X. St. Charles, Montreal	24520
" 17		P. Simard, St. Jérôme	Gooderham & Worts, Toronto	24522
" 17		Ed. Langlois "	P. Simard, St. Jérôme	24524
Aug. 18		Desjardin & Co., 65 Commissioners St., Montreal.	D. Lariverre & Co	21323
		Louis Payette & Co., 125 Commissioners St., Montreal.	L. O. Wilson & Co	21324
Aug. 18		T. N. Laganier, 11 Commissioners St., Montreal.	L. Chaput, Fils & Co., Montreal	21327
" 20		Joseph Valiquette, Montreal	Purchased with other stock from J. Octeau.	21334
" 20		T. Brisson, 139 Commissioners St.	Not given	21336
" 20		A. Charboneau, 12 William St., Montreal.	L. Chaput & Co	21337
" 20		E. Gauvreau, 185 Commission'rs St.	Blended by vendor	21341
" 21		J. Frail, 133 Commissioners St	Boivin, Wilson & Co	21343
" 21		Emile Délisle, 522 Lagauchetière St.	F. X. St. Charles, Montreal	21346
" 21		Dame & Frère, 1356 DeMontigny St.	L. Chaput et Fils, Montreal	21348
" 21		Thos. Barry, 864 St. Dominique St.	" "	21349
		D. Ashdanase, 573 Marie Anne	Laporte, Martin & Co., Montreal.	21351
		Oscar Rivet, 2394 Notre Dame St.	Not given	21353
Aug. 21		Mde. Lapierre, 3735 Notre Dame St., St. Cunegonde.	Laporte, Martin & Co., Montreal.	21356
" 21		J. Nevu, Notre Dame St., St. Henri.	Not given	21357
		V. Boileau, 836 St. Catherine St.	Bottled by vendor	21360
Aug. 26		E. Kennedy, Smith's Falls, Ont.	J. P. Wiser	21438
" 26		McDermott & McCarthy, Prescott.	Bottled by vendor	21442
" 27		Antoine Wendling, Brockville	Taken from bottle as served at bar	21440
" 31		E. Halliday, Kingston, Ont	" "	21443
" 31		Thos. J. Leahy "	Meagher Bros., Montreal	21446
" 31		Jas. McParland "	Gooderham & Worts, Toronto	21447
" 31		J. Halligan "	Bottled by vendor	21449
" 31		Rigney & Hickey "	"	21451
		C. McLean "	Taken from vessel in bar. Seagram's.	21453
Aug. 31		Chas. Lyon, Kingston	Taken from vessel in bar, Seagram's.	21454

SESSIONAL PAPER No. 14

Tabulated Statement.

Result of Analysis.								
Specific Gravity of Sample.	Spirit Gravity	Difference.	Fixed Matter.	Alcohol.		Proof Spirit.	Observations.	
				Weight.	Volume			
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.		
9464	·9441	0023	. . . . .	37·61	44·73	78·39	Above British standard strength in alcohol by 3 39 per cent proof spirit.	
·9500	9484	0016	2·400	35·30	42·17	73·91	Below	1 09
·9477	9444	·0033	4·200	37·44	44·55	78·07	Above	3 07
9623	·9615	·0008	1·720	27·57	33·39	58 53	Below	16 47
9438	9429	·0009	1·680	38 28	45·47	79 68	Above	4 68
9474	·9432	·0042	6·320	38·11	45·28	79·36	"	4 36
9594	9583	0011	1·530	29·67	35·81	62·76	Below	12 24
9602	·9593	·0009	1·720	29·00	35·05	61·42		13 58
9529	·9523	·0006	1·260	33·29	39·94	69 99		5 01
9444	·9429	·0015	1·700	38·28	45·47	79·68	Above	4 68
9529	·9520	·0009	3·500	33 47	40 14	70·34	Below	4 66
9561	9543	·0018	2·700	32·06	38·53	67·55		7 45
9707	9682	·0025	3·940	22 69	27·68	48·50		26 50
9527	9509	0018	2·100	34·10	40·84	71 58		3 42
9544	9538	0006	0·960	32·37	38·89	68·17		6 83
9606	·9588	0018	2·540	29·33	35·43	62·09		12·91
9484	9480	·0004	1·000	35·50	42·40	74·30		0·70
·9635	·9622	0013	1·780	27·67	32·81	57·51		17·49
·9483	9453	0030	2·500	36·94	44·00	77·10	Above	2 10
9473	·9450	0023	2·420	37·11	44·18	77·42	"	2 42
9496	·9484	0012	2·360	35·30	42·17	73·91	Below	1·09
9689	·9684	0005	0·800	22·54	27·49	48·18		26 82
9656	9656	0010	1·220	24·69	30·04	52 64		22 36
·9701	·9694	0007	1 86	21·77	26·58	46·59		28 41
9639	·9620	0010	1 740	26·60	32·27	56·55		18 45
·9703	·9699	0004	0·660	21·38	26·13	45·79		29 21
9708	9699	·0009	1·640	21·38	26·13	45·79		29 21
9694	·9689	0005	1·460	22 15	27·04	47 39		27 61
9603	·9597	0006	1·200	28·75	34·76	60·91		14 09
9660	9652	0008	1·220	25·00	30·40	53·27		21 73
9610	·9591	0019	1 200	29·13	35·20	61·69		13 31
·9548	·9531	0017	1·540	32·81	39·40	69·04	"	5 96
9589	·9580	·0009	1·380	29·87	36 04	63·17	"	11 83
9612	9602	0010	2·100	28·44	34·40	60·28	"	14 72
·9696	·9679	0017	1·080	22·92	27·95	48·98	"	26 02
9690	·9662	0028	3·280	24·23	29·49	51·69	"	23 31
9646	9638	0008	1·020	26·00	31·57	55 32	"	19 68
9553	9542	0011	2·280	32·12	38·60	67·67	"	7·33
9616	·9611	·0007	1·640	27·86	33·73	59·11	"	15 89
9484	9476	·0008	1·30	35·70	42·62	74·68	"	0 32
·9481	·9475	·0006	1·360	35·75	42·67	74 78	"	0 22
·9511	·9492	·0019	4·440	34·90	41·74	73·14	"	1·86
9476	·9465	0011	2·720	36·28	43·26	75·80	Above	0·80
9569	·9554	0015	1·340	31 37	37·76	66·18	Below	8 82
9470	·9460	0010	2·620	36 06	43·01	76·34	Above	1 34
9629	·9608	·0021	1·960	28·06	33·97	59·53	Below	15 47
·9517	9509	0008	2·44	34·10	40·84	71·58	"	3·42

INSPECTION OF RYE WHISKEY—

Date of Collection.	Nature of Sample.	Name and Address of Vendor.	Name and Address of Manufacturer or Furnisher.	Number of Sample.
Sept. 2		D. Smith, Market Sq., Hamilton	Murray & Lottridge, Hamilton	23201
" 2		Chas. Schwenger "	Not given	23203
" 2		P. J. Galvin "	"	23205
" 2		Hazell & Sons, King St. "	Bottled by vendor	23207
" 2		J. O. Carpenter "	"	23208
" 3		John Mathers, 152 King West, Toronto.	"	23210
" 3		Geo. Stram, 252 King West, Toronto.	Kept on draught in bar	23212
" 3	Fine Old Canadian Rye.	E. Morgan, 491 Queen East, Toronto.	Bottled by vendor	23213
		C. E. Vardon, 543 Queen East, Toronto.	"	23216
Sept. 3		M. Wade, 502 Portland St., Toronto.	Kept on draught	23217
" 3		T. Reynolds, 837 Queen East, Toronto.	Bottled by vendor	23220
Aug. 20		Thos. J. Bell, Clinton, Ont	Hiram Walker, Walkerville, Ont.	22111
" 20		W. W. Sault, Goderich	Lucas, Steele & Bristow, Hamilton	22113
" 25		Jeremiah Miller, Harrison, Ont	Gooderham & Worts, Toronto	22128
" 25		John Garbet "	Joseph Seagram, Waterloo	22129
" 25		Richard Handly, Walkerton	"	22133
" 25		Louis Plaff, Mount Forest	Gooderham & Worts, Toronto	22137
Sept. 1		Joseph E. Seagram, Waterloo	Joseph E. Seagram	22146
" 2		W. G. Bernhart, Galt, Ont	Royal Distillery, Hamilton	22151
" 2		John Stockfish, Preston, Ont	Joseph E. Seagram, Waterloo	22152
" 2		Joseph Weyper, Preston	Royal Distillery, Hamilton.	22153
		Harding Bros., Guelph	H. Walker & Son, Walkerville	22154
Sept. 2		Frank Hall, Guelph, Ont	H. Walker & Sons, Walkerville	22155
" 2		E. Dawson, Seaforth	H. Corby, Belleville	22157
Aug. 29		A. Bernard, Winnipeg	J. E. Seagram, Waterloo, Ont	23713
" 29		Paul Sala "	H. Walker & Sons, Walkerville, Ont.	23714
" 29		J. Lemaire "	" "	23715
" 30		Beleviau & Co. "	" "	23716
Sept. 3		S. Demers "	G. F. J. Gates, Winnipeg	23717
" 3		D. Ripsteins "	Geo. Vetu, Winnipeg	23719
" 4		T. D. Cavannagh, Winnipeg		23720
" 8		T. F. Ellis, Red Deer	H. Walker Sons, Walkerville	21746
" 10		A. Laurandeau, Edmonton	Gooderham & Worts, Toronto	21750
" 10		F. X. Paré & Co., Strathcona	H. Walker & Sons, Walkerville	21758
" 15		R. J. McKeran "	Gooderham & Worts, Toronto	21759
" 15		J. A. Young, Calgary	Hiram Walker, Walkerville	21762
" 15		Jas. Doyle "	Gooderham & Worts, Toronto	21763
Aug. 25		W. Jones, Vancouver	Hudson Bay Co., Vancouver	23554
" 25		T. Roberts "	Pither & Leiser, Victoria	23555
" 25		A. Calore, Europe Hotel, Vancouver.	"	23557
" 25		Geo. Waring, Nanaimo	Hudson Bay Co., Victoria	23581
" 28		F. Mondor, St. Boniface	Gooderham & Worts, Toronto	23708
" 21		T. A. Newman Bros., Portage la Prairie.	" "	17487 17497

NOTE.—Of 91 samples of rye whiskey 25 are above standard strength in alcohol, and 66 are below that trength.

All samples below standard strength have been examined for alkaloids. No alkaloids have been found.

None of the samples gave reactions for furfurol.

None of the distillates gave any opalescence on diluting with water.

SESSIONAL PAPER No. 14

Tabulated Statement—*Continued.*

Result of Analysis.							
Specific Gravity	Spirit Gravity	Difference.	Fixed Matter.	Alcohol.		Proof Spirit.	Observations.
				Weight.	Volume.		
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	
·9604	·9594	·0010	1·06	28·94	34·97	61.29	Below British standard strength in ale—by 13·71 per cent proof spirit.
·9632	·9621	·0011	1·20	27·14	32·90	57·65	" " 17·35 " "
·9515	·9512	·0003	1·14	33·94	40·67	71·27	" " 3·73 " "
·9547	·9532	·0015	1·02	32·75	39·32	68·92	" " 6·08 " "
·9552	·9542	·0010	0·86	32·12	38·60	67·67	" " 7·33 " "
·9514	·9493	·0021	6·04	34·68	41·69	73·05	" " 1·95 " "
·9654	·9638	·0016	2·10	26·00	31·57	55·32	" " 19·68 " "
·9483	·9465	·0018	4·16	36·28	43·26	75·80	Above " 0·80 " "
·9477	·9469	·0008	2·26	36·06	43·01	75·37	" " 0·37 " "
·9603	·9597	·0006	2·98	28·75	34·76	60·91	Below " 14·09 " "
·9653	·9636	·0017	1·84	26·13	31·72	55·59	" " 19·41 " "
·9584	·9577	·0007	1·14	30·06	36·26	63·55	" " 11·45 " "
·9484	·9480	·0004	1·08	35·50	42·40	74·30	" " 0·70 " "
·9642	·9621	·0021	2·82	27·14	32·90	57·65	" " 17·35 " "
·9482	·9450	·0032	5·46	37·11	44·18	77·42	Above " 2·42 " "
·9575	·9573	·0002	0·140	30·28	36·51	63·99	Below " 11·01 " "
·9472	·9466	·0006	2·740	36·22	43.19	75·70	Above " 0·70 " "
·9485	·9474	·0011	1·920	35·80	42·73	74·88	Below " 0·12 " "
·9607	·9600	·0007	2·12	28·56	34·54	60·53	" " 14·47 " "
·9474	·9460	·0014	1·90	36·56	43·56	76·34	Above " 1·34 " "
·9609	·9603	·0006	2·06	28·37	34·33	60·16	Below " 14·84 " "
·9477	·9470	·0007	1·12	36·00	42·95	75·26	Above " 0·26 " "
·9496	·9480	·0016	0·96	35·50	42·40	74·30	Below " 0·70 " "
·9604	·9596	·0008	2·00	28·81	34·83	61·04	" " 13·96 " "
·9591	·9575	·0016	4·88	30·17	36·39	63·77	" " 11·23 " "
·9492	·9485	·0007	1·22	35·25	42·12	73·81	" " 1·19 " "
·9607	·9600	·0007	0·90	28·56	34·54	60·53	" " 14·47 " "
·9579	·9560	·0019	1·32	31·00	37·34	65·43	" " 9·57 " "
·9528	·9520	·0008	2·16	33·47	40·14	70·34	" " 4·66 " "
·9475	·9463	·0012	2·60	36·39	43·38	76·02	Above " 1·02 " "
·9703	·9689	·0014	2·78	22·15	27·04	47·39	Below " 27·61 " "
·9443	·9435	·0008	1·56	37·94	45·10	79·04	Above " 4·04 " "
·9475	·9466	·0009	2·44	36·22	43·19	75·70	" " 0·70 " "
9510	·9498	·0012	1·52	34·62	41·42	72·59	Below " 2·41 " "
·9485	·9464	·0021	2·40	36·33	43·32	75·91	Above " 0·91 " "
·9626	·9509	·0117	30·08	34·10	40·84	71·58	Below " 3·42 " "
·9487	9466	·0021	2·56	36·22	43·19	75·70	Above " 0·70 " "
·9485	·9477	·0008	1·48	35·65	42·56	74·59	Below " 0·41 " "
·9479	·9453	·0026	2·60	36·94	44·00	77·10	Above " 2·10 " "
·9479	·9463	·0016	1·86	36·39	43·38	76·02	" " 1·02 " "
·9489	·9463	0026	2·42	36·39	43·38	76·02	" " 1·02 " "
·9483	·9460	·0023	2·40	36·56	43·56	76·34	" " 1·34 " "
·9477	·9467	·0010	2·28	36·17	43·13	75·59	" " 0·59 " "
·9494	·9480	·0014	1·10	35·50	42·40	74·30	Below " 0·70 " "

The solid (fixed) matter in solution varies from 0·14 to 30·08 parts per 1,000. (Weight in volume.)

It averages about 2 parts per 1,000 (= 0·2 per cent), and instances of great variation from this number are exceptional.

The solid matter is essentially tannins and caramelized sugar.

No deleterious substances have, in any case, been found.

INSPECTION OF WHITE WHISKEY—

Date.	Name and Address of Vendor.	Name and Address of Manufacturer or Furnisher as given by Vendor.	Number of Sample.
Aug. 27..	M. J. Foley, Souris, P.E.I.	Sullivan & Co., St. John, N.B.	4371
" 28..	Rinfret et Fils, Rimouski, Que.	Wiser, Prescott	24501
" 28.	A. Caron, Rimouski, Que.	" "	24502
" 29..	Geo. St. Pierre et Cie., Rivière du Loup.	Corby, Belleville	24506
Sept. 1..	A. Saunders, Lévis	Ed. Couture, Lévis	24513
Aug. 18..	J. Colas, 63 Commissioners St., Montreal	L. D. Wilson, Montreal	21320
" 18..	Louis Payette & Co., 125 Commissioners	" "	21325
" 18..	E. Delcourt, 38 St. Paul St.	Mathieu Freres, Montreal	21328
" 18.	H. Courtois, 39 St. Paul St.	L. D. Wilson & Co., Montreal	21331
" 20..	Joseph Valiquette, 127 Commissioners	Not given	21335
" 20..	L. McNiece, 121 Duke St.	"	21339
" 20..	A. J. Oviell, 155 Wellington	Laporte, Martin & Co., Montreal	21346
" 20..	J. Fraid, 133 Commissioners	Boivin, Wilson & Co., Montreal	21344
" 21..	Mde. Lapierre, 3735 Notre Dame	Laporte, Martin & Co., Montreal	21354
" 22..	P. Barnage, 635 Notre Dame	F. X. St. Charles, Montreal	21358
" 26.	E. Kennedy, Smith's Falls, Ont.	J. P. Wiser, Prescott	21439
" 31..	Rigney & Hickey, Kingston, Ont.	Bottled by vendor.	21450
Sept. 2.	J. D. Carpenter, Market Sq., Hamilton.	" "	23209
" 3..	John Mathers, 152 King St. W., Toronto	" "	23211
" 3..	M. Wade, 502 Portland St., Toronto	Kept on draught	23218
Aug. 22..	Joseph Weber, Seaforth, Ont.	Joseph Seagram, Waterloo	22117
Sept. 1..	W. G. Bernhardt, Galt, Ont.	" "	22150
" 8..	Thomas Quirk, Stratford, Ont.	Royal Distillery, Hamilton	22158
Aug. 24..	R. E. Trumbell, Brandon, Man.	Gooderham & Worts, Toronto	17492
Sept. 3.	D. Cleland, Winnipeg	" " "	23718
" 9..	Nils Schmidt, Wetaskiwin, Alta	Hamilton Distillery, Hamilton, Ont.	21747
Aug. 22..	P. Barnage, 635 Notre Dame St., Montreal	F. X. St. Charles, Montreal.	21358
" 31..	Jas. McParland, Kingston.	Gooderham & Worts	21448
" 21.	D. Ashdanase, 573 Marie Anne St., Montreal	Chaput et Fils, Montreal	21350
Sept. 5..	A. Rousseau, Coaticook	C. A. French, Sherbrooke	24517

NOTE.—All samples below standard strength (75 per cent of proof) have been examined for alkaloids. Of 30 samples of white whiskey, 25 are below standard, 20 being more than 5 per cent below and 18

IRISH

Aug. 22..	H. Finnegan, 224 Pr. William St., St. John, N.B.	Edward & J. Burke, Dublin, Ireland.	17957
Sept. 8..	J. W. Smith, Water St., St. Stephen, N.B.	Dublin Whiskey Distillery Co., Dublin, Ireland.	17962

NOTE.—Both of these samples gave decided reactions for furfurol, and opalescence on dilution of the

Tabulated Statement.

Specific Gravity of Sample.	Spirit Gravity	Difference.	Solids. Parts per thous'nd	Alcohol. Weight.	Alcohol. Volume	Proof Spirit.	Observations.
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	
9464	9441	·0025	. .	37 61	44·73	78·39	Above British standard strength in alcohol by 3·39 per cent of proof spirit.
9547	9540	·0007	0·32	32·25	38·75	67 92	Below " 7 08
9582	·9577	0005	0 64	30·06	36·26	63 55	" " 11 45
9647	9641	0006	0 26	25·79	31·32	54 88	" " 20 12
9620	9617	·0003	0·14	27 43	33·23	58 24	" " 16·76
9696	9694	·0002	0 06	21·77	26 58	46·59	" " 28·41
9654	·9652	0002	0·12	25·00	30·40	53·27	" " 21 73
9681	9681	·0000	0·08	22 77	27·77	48 66	" " 26 34
9618	·9614	·0004	0·06	27 64	33·48	58 67	" " 16 33
9682	9681	·0001	0·22	22·77	27·77	48·66	" " 26 34
9759	·9753	·0006	0·10	17 00	20·89	36 60	" " 38 40 Lowest spirit strength.
·9701	9697	·0004	0·40	21 54	26·31	46·11	" " 28 89
9702	9700	0002	0 08	21 31	26·04	45 63	" " 29 37
9689	9685	·0004	0·12	22 46	27·40	48·02	" " 26·98
9730	9728	·0002	0·24	19 00	23 28	40·80	" " 34·20
·9587	9586	0001	0·08	29·47	35·58	62·36	" " 12 64 " "
9421	9389	·0032	10·06	40 35	47 72	83·64	Above " 8 64 " " Highest spirit strength.
9476	·9473	0003	0·15	35 85	42·78	74·97	Below " 0 03
9467	·9465	0002	0·06	36·28	43·26	75·80	Above " 0 80
·9631	·9615	0016	3·86	27 57	33 39	58·53	Below " 16·47
9530	9509	0021	2·80	34 10	40·84	71·58	" " 3·42
9500	·9494	0006	0·16	34 81	41 63	72·96	" " 2 04
·9519	·9518	·0001	0·38	33 59	40·27	70·57	" " 4 40
·9480	9460	0020	2·10	36 56	43 56	76·34	Above " 1 34
9567	9551	0016	1 40	31 56	37·97	66·55	Below " 8 45
9492	9473	·0019	. . .	35 85	42·78	74·97	" " 0 03
9723	·9722	0001	. .	19 50	23·88	41 85	" " 33 15
9449	·9429	0020	5·84	38 28	45·47	79 68	Above " 4 68
·9677	·9677	0000	0·16	23 08	28·13	49·30	Below " 25 70
9647	·9645	0002	0·16	25·50	30·98	54·30	" " 20·70

No alkaloids have been found in any sample.
more than 10 per cent below, while 13 samples are more than 20 per cent below standard.

WHISKEY.

9435	9407	0028	2 80	39 45	46·75	81·93
9101	·9087	0014	0·94	54 14	61 98	108·62

distillate with water.

INSPECTION OF SCOTCH WHISKEY—

Date.	Name and Address of Vendor.	Name and Address of Manufacturer or Furnisher as given by Vendor.	Name of Brand.	Number of Sample.
1903.				
Sept. 8..	Kelly & Glassey, Halifax.....	Sheriff & Co., Scotland	.....	20357
" 9..	T. H. Renner, Halifax.	McPherson & Co., Scotland. ...	Fernbank***	20339
" 10..	James Scott & Co., Halifax.....	Bullock Lade, Scotland.	.....	20344
" 10..	C. D. Norton, Halifax.....	Cameron & Co., Scotland.....	.....	20345
" 10..	T. F. Courtney & Co., Halifax....	Bullock Lade, Scotland.....	.....	20347
" 11..	T. Pearson, Halifax.....	.....	.....	20350
" 10..	Town of Bridgewater, Bridgewater	J. Buchanan & Co	The Buchanan Blend.....	20375
Aug. 21..	Byrne Bros., Charlottetown	Cowan & Co., Glasgow.....	.....	4353
" 24..	A. McDonald, Charlottetown.....	Bullock, Lade & Co., Scotland...	.....	4358
" 25..	P. N. Enman, Sunnyside.....	Haigge & Haigge, St. John, N.B.	.....	4365
" 21..	McIntyre & Comeau, St. John, N.B	M. B. Foster & Sons, London and Glasgow.....	Bugle brand.....	17932
" 21..	R. Sullivan & Co., St. John, N.B.	Mackie & Co., Ltd., Glasgow....	.....	17934
" 26..	A. E. Holstead, Moncton, N.B...	Wright & Greigs, Glasgow.....	Premier	17947
Sept. 12..	McDonald & Heeney, Fredericton.	James Buchanan & Co., Glasgow, Scotland.....	.....	17975
Aug. 18..	E. Delcourt, 38 St. Paul St., Montreal.....	J. Townsend, Montreal.....	.....	21329
" 20..	E. Gauvreau, 185 Commissioner St., Montreal.....	Blended by vendor	.....	21342
" 31.	Thos. J. Leahy, Kingston, Ont...	Mitchell's	.....	21445
Sept. 10..	J. Diamond, Edmonton.....	Hugh McKinnon, Glasgow, Scotland.....	.....	21752
Aug. 25..	C. Anderson, Vancouver.....	J. Dewar, Scotland.	.....	23552
25..	R. Asbeith, Vancouver.....	White & McKay, Scotland.....	.....	23556
Sept. 2..	J. Mahrer, Nanaimo.....	J. Watson & Co., Dundee, Scotland.	.....	23582
" 6..	Faith & Seeley, New Westminster.	Pither & Lerser, Victoria.....	.....	23592
				4354
				22159

NOTES.—1. A furfurol reaction was obtained, more or less distinctly, with all samples of Scotch proof (= B. 30 under proof). 3. The average fixed matter in solution is 1·54 per thousand

Tabulated Statement.

Result of Analysis.							Observations.
Specific Gravity	Spirit Gravity	Difference.	Solids Parts per 1,000.	Alcohol.		Proof Spirit.	
				Weight.	Volume		
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	
·9402	9391	0011	2·48	40·25	47·62	83 45	No opalescence on dilution of distillate.
·9392	·9384	·0008	0·46	40·60	47·99	84·11	No opalescence on dilution of distillate.
9475	9457	0018	2·60	36·72	43·75	76·67	
·9435	·9430	0005	0·74	38·22	45·41	79·57	
·9384	·9376	·0008	1·58	41·00	48·43	84·87	
9587	·9568	0019	4·14	30 56	36·83	64·54	Below standard strength in alcohol.
·9381	9374	0007	1·60	41·10	48·54	85·06	
·9432	·9427	·0005	0·72	38·39	45·59	79·89	
·9238	9223	0015	1·36	48·14	55·93	98·01	
·9384	·9377	·0007	1·16	40·95	48·37	84·77	
9425	9422	0003	0·54	38·67	45·89	80·43	
·9381	9366	0015	2 04	41·50	48·97	85·81	
9415	9403	0012	1·36	39·65	46·97	82·31	
·9389	·9377	0012	1·70	40·95	48·37	84·77	
·9494	9488	·0006	0·80	35 10	41·95	73·52	
9262	·9243	0019	2·64	47·23	54·99	96 39	
9264	·9260	·0004	0·82	46·46	54·19	94 97	
·9140	9130	0010	1·60	52·23	60·07	105·27	
9111	·9105	·0006	0·62	53·35	61·19	107·23	
·9258	·9246	0012	2 56	47·09	54·85	96·12	
9170	9163	0007	1·02	50·83	58·67	102·82	No opalescence on dilution of distillate.
·9399	·9385	0014	3·02	40 55	47·94	84·02	Furfurol reaction doubtful.
9425	·9416	0009	0·92	39·00	46·26	81·07	
·9377	9374	0003	0·42	41·10	48·54	85·06	

Whiskey, except No. 23582.

2. The average spirit strength of these samples is 86·70 per cent of (= 0·154 per cent weight in volumes).

INSPECTION OF GIN—

Date.	Name and Address of Vendor.	Name and Address of Manufacturer or Furnisher as given by Vendor.	Number of Sample.
Aug. 25..	J. D. Gourlay, Sunnyside, P.E.I	Beale & Co., St. John, N.B	4364
Sept. 10..	Jas. Scott & Co., Halifax, N.S	Heukes, Holland, bottled by vendor	20343
" 10..	T. F. Courtenay & Co., Halifax	" "	20346
" 18..	Town of Bridgewater, N.S	" "	20376
Aug. 22..	J. D. Regan, St. John	John De Kuyper & Son, Rotterdam	17935
" 28..	R. H. Armstrong, Newcastle, N.B	Blankenleigm & Nolet, Rotterdam	17951
Sept. 10..	C. Curlen, Grand Falls, N.B	John De Kuyper & Son	17966
" 12..	John M. Wiley, Fredericton	John D. Regan, St. John, N.B	17974
" 1..	Raymond Bilodeau, Levis, Que	Carrière et fils, Levis	24511
" 16	Victor Lefebvre, Lachute	Nap. Carrière, Lachute	24521
Aug. 18..	J. Colas, Montreal	L. A. Wilson & Co., Montreal	21321
" 18..	Desjardin & Co., Montreal	D. Larivière & Co., Montreal	21322
" 18..	T. N. Laganière, Montreal	L. Chaput, fils & Co., Montreal	21326
" 18..	Mrs. D. Racine, Montreal	L. D. Wilson & Co	21333
" 20..	Mrs. M. Murphy, Montreal	Blended by vendor	21338
" 20..	Alex. Boiron, Montreal	Boivin, Wilson & Co	21345
" 21..	A. U. Monast, Montreal	A. Robitaille, Montreal	21352
" 21..	P. N. Thibault, Montreal	Hudon, Hebert & Co., Montreal	21355
" 22..	E. Menard, Montreal	Boivin, Wilson & Co	21359
" 31..	E. Halliday, Kingston		21444
Sept. 2..	D. Smith, Hamilton		23202
" 2..	Hazell & Sons, Hamilton	Bottled by vendors	23206
" 3..	E. Morgan, Toronto	Kept on draught	23214
" 1..	Wm. Metcalfe, Berlin	Bordin & Watson, Montreal	22143
Aug. 28..	G. Arial	Richard & Co., Winnipeg	23710
" 29..	Richard & Co., Winnipeg	John De Kuyper, Holland	23711
			21441

NOTES.—All the above samples of gin, excepting No. 23710, gave distinct reactions for furfurol and a (Great Britain) fixed the minimum limit of spirit strength for gin at 65 per cent of proof. This is the examined for alkaloids. No alkaloids have been found in any sample. The average spirit strength found spirit strength is 47·70 per cent of proof.

SESSIONAL PAPER No. 14

Tabulated Statement.

Result of Analysis.							
Specific Gravity	Spirit Gravity	Difference.	Solids Parts per 1000.	Alcohol.		Proof Spirit.	Observations.
				Weight.	Volume		
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	
·9262	·9257	·0005	0·12	46·59	54·33	95·22	
·9443	·9436	·0007	0·14	42·95	50·52	88·53	
9326	·9316	·0010	0·60	43·90	51·53	90·30	
9476	·9473	·0003	0·10	35·85	42·78	74·97	
9420	·9418	0002	0·06	38·89	46·14	80·86	
·9445	·9436	·0009	0·88	37·89	45·04	78·93	
9225	·9222	·0003	0·36	48·18	55·97	98·09	
·9217	·9214	·0003	0·10	48·55	56·35	98·75	
9527	·9521	0006	1·14	33·41	40·07	70·23	
·9506	·9501	·0005	0·16	34·48	41·26	72·31	
·9660	·9656	·0004	0·24	24·69	30·04	52·64	Below British standard strength in alcohol.
·9545	·9540	0005	0·20	32·25	38·75	67·92	
·9615	·9613	·0002	0·38	27·71	33·56	58·82	
·9550	·9544	·0006	0·38	32·00	38·47	67·42	
9595	·9591	0004	0·18	29·13	35·20	61·69	
9682	·9679	·0003	0·12	22·92	27·95	48·98	Much
·9691	·9687	·0004	0·20	22·31	27·22	47·70	
9573	9570	·0003	0·36	30·44	36·70	64·32	
·9664	·9660	·0004	0·24	23·92	29·13	51·00	
9350	·9342	·0008	0·22	42·67	50·21	88·00	
9338	·9336	·0002	0·14	42·95	50·52	88·53	
·9336	9320	·0016	1·34	43·71	51·32	89·95	
·9500	·9491	0009	0·40	34·95	41·79	73·24	
9429	·9426	·0003	0·20	38·44	45·65	80·00	
·9789	·9676	0113	30·16	23·15	28·22	49·46	'Old Tom Gin,' below British standard in alcohol.
9326	·9316	·0010	0·64	43·90	51·53	90·30	
·9475	9470	·0005	0·12	36·00	42·95	75·26	

turbidity (opalesence) on dilution of the distillate with water. The Sale of Food Amendment Act of 1879 standard referred to in the marginal notes. All samples below 65 per cent of spirit strength have been for 27 samples of gin is 74·97 per cent. The highest spirit strength is 98·91 per cent of proof. The lowest

INSPECTION OF RUM—

Date of Collection	Nature of Sample.	Name and Address of Vendor.	Name and Address of Manufacturer or Furnisher.	Number of Sample.
Aug. 22	Jamaica Rum...	G. E. Hughes, Charlottetown....	L. A. Wilson, Montreal....	4356
" 27..	Demerara Rum..	M. J. Foley, Souris, P.E.I	R. Sullivan & Co., St. John, N.B.	4366
Sept. 8.	" ..	Kelley & Glassey, Halifax, N.S..	Sanback & Parker, Demerara, B.W.I.	20336
" 9..	Jamaica Rum...	P. Donahue & Sons . " ..	Unknown.....	20342
" 11..	Demerara Rum..	A. L. Miller " ..	"	20349
" 21..	" ..	M. H. Townsend, Kentville, N.S	T. F. Courtney, Halifax.....	20384
" 22..	"Golden Glow," Jamaica Rum.	John D. Regan, St. John, N.B..	J. Brown & Co., London, Eng....	17936
" 2..	.....	M. Thibaudeau, Quebec.....	Ledroit Frères, Quebec.....	24514
" 3..	Rum.....	Hardmarsh & Martin, Nanaimo, B.C.	Pither & Leiser, Victoria, B.C....	23580
" 3..	"	J. Mahrer, Nanaimo, B.C.....	J. D. Watson & Co., Dundee, Scot.	23583
" 4..	"	Mrs. Stevens, Ladysmith.....	Hudson Bay Co., Victoria, B.C.	23585
.....	"	Reuben Elley, New Westminster	" Vancouver.....	23591

NOTE.—All the above samples of rum gave reaction for furfurol; and the distillates, on dilution with water, became distinctly opalescent.

The average strength for 12 samples of rum is 97·14 per cent. of proof spirit.

The average amount of solid matter in solution is 6·53 grammes per litre, or 0·653 per cent (weight in volume).

Tabulated Statement.

Result of Analysis.							
Specific Gravity of Sample.	Spirit Gravity.	Difference	Solids in Solution.	Alcohol.		Proof Spirit.	Observations.
				Weight.	Volume.		
			p. c.	p. c.	p. c.	p. c.	
·9526	·9509	·0017	3·30	34·10	40·84	71·58	Lowest spirit strength found.
·9392	·9364	·0028	4·74	41·60	49·07	86·00	
9363	9332	0031	9·06	43·14	50·72	88·88	
·9380	·9362	·0018	5·74	41·70	49·18	86·18	
·9480	·9450	·0030	5·88	37·11	44·18	77·42	
·9247	·9232	·0015	3·74	47·73	55·51	97·27	
·9407	·9382	·0025	6·18	40·70	48·10	84·30	
·8933	·8878	·0055	12·08	63·35	70·85	124·16	
·8991	·8966	0025	7·00	59·57	67·28	117 90	
·8812	·8773	·0039	6·00	67·83	74 97	131·38	Highest "
9322	·9297	·0025	5·20	44·77	52·14	91·90	
·9145	·9112	·0033	9·42	53·04	60·89	106·71	

The maximum solids = 12·08 grammes per litre.
The minimum " = 3·30 "
This solid matter is chiefly caramelized sugar.

INSPECTION OF BRANDY—

Date of Collection	Nature of Sample.	Name and Address of Vendor.	Name and Address of Manufacturer or Furnisher.	Number of Sample.
Aug. 21	Brandy	Byrne Bros., Charlottetown	Archambeaud Frères, France	4352
" 21		A. W. Reddin "	Cognac Distillery Assn. "	4357
Sept. 8		Kelley & Glassey, Halifax	Rouger Guillet & Co. "	20338
" 9		Dillon Brcs. "	Gerrard & Co. "	20341
" 11		G. Verdi "	Unknown	20348
Aug. 21		C. N. Beale & Co., North Wharf, St. John.	Boutelleau & Co., Barbezein near Cognac, France.	17933
" 29		Henry White, Bathurst, N.B.	Meagher Bros. & Co., Montreal	17955
Sept. 11		J. E. Sheasgreen, Woodstock, N.B	Evans Sons & Co., Ltd. "	17970
Aug. 31		J. N. Anctil, Rivière du Loup	L. A. Wilson "	24504
" 31		N. Fournier, Montmagny	Carrière & fils, Lévis, Que.	24509
Sept. 2		A. Parent, Quebec	J. Baillargeon, Quebec	24515
" 5		J. R. Roy, Coaticook	Walker	24519
		C. E. Laflamme, St. Jérôme	L. Chaput et fils, Montreal	24523
Aug. 18		Mrs. A. Racine, 99 St. Paul St., Montreal.	L. A. Wilson & Co. "	21332
" 21		Jossph Boyer, 133 St. Dominique, Montreal.	F. X. St. Charles "	21347
" 31		Rigney & Hickey, Kingston	Bottled by vendor	21452
" 31		T. H. Pelou, Kingston	"	21455
Sept. 2		Chas. Schwenger, Hamilton	Not given	23204
" 3		C. E. Vardon, 543 Queen East, Toronto.	Kept on draught	23215
" 3		T. Reynolds, 837 "	"	23219
Aug. 24		A. Munroe & Co., Brandon, Man	Champane Vineyard, Boutelleau, France.	17493
" 29		W. J. Sherman, Winnipeg		23712
" 25		C. Johnston, Vancouver, B.C.	Pither & Leiser, Victoria.	23553
" 25		Jos. Nauthwell, Nanaimo	" "	23579
Sept. 4		John Tha, Ladysmith, B.C	Did not know	23584
" 6		J. E. Hughes, New Westminster.	H. Freeman, New Westminster.	23588
		The foliowing samples were purchased in Ottawa, Oct. 27, 1903.		
	One Star	Bate & Co	Own bottling	
	Three Stars	"	"	
	V.O	"	J. Hennessy & Co.	
	V.S.O.P.	"	J. F. Martell	

NOTES:—

In 30 samples of brandy the highest alcohol found is 106·23 per cent proof spirit; the lowest is 60·66 per cent proof spirit.

The average spirit strength is 77·62 per cent.

Only 5 samples fall below 75 per cent of proof spirit, and only 2 samples below 70 per cent.

Tabulated Statement.

Result of Analysis.								
Specific Gravity of Sample.	Spirit Gravity.	Difference.	Solids of Solution	Alcohol.		Proof Spirit.	Furfurol reaction.	Opalescence on dilution of distillate.
				Weight.	Volume			
			p. c.	p. c.	p. c.	p. c.		
·9412	·9355	0057	15 54	42·05	49 55	86 84	Decided	Decided.
·9169	·9156	0013	2·72	51·13	58·97	103·34	"	"
·9378	·9332	0046	12·40	43 14	50 72	88·88		
·9452	·9432	0020	5·44	38·11	45 28	79·36	Faint	Faint.
·9547	·9539	·0008	3·28	32·31	38 82	68·04	"	"
·9240	·9204	0036	13·22	49·00	56 82	99·57	Decided	Decided.
·9609	9599	·0010	3·14	28 62	34 61	60·66	"	"
·9506	·9491	0015	4·10	34 95	41 79	73·24	Faint	Faint.
·9212	·9188	0024	5·04	49 73	57 54	100·85	Decided	Decided.
·9387	·9308	·0079	16·84	44 27	51 91	90·98	"	"
·9338	·9302	·0038	10·52	44·55	52 20	91·48	"	"
·9322	·9289	·0033	15·32	45 14	52 82	92·56	Faint	Faint.
·9201	·9172	·0029	11·80	50·43	58·28	102·12	"	"
9512	·9489	0023	4 52	35·05	41 90	73·43	Decided	"
·9398	9366	·0032	4·76	41 50	48 97	85·81	Faint	"
9211	·9187	0024	9·80	49·77	57 59	100·93	Decided	Decided.
9153	·9118	0035	11·66	52·77	60 61	106·23	"	"
·9180	·9147	0033	10·04	51 50	59 34	104·00	Faint	Faint.
·9257	·9181	·0076	24·16	50·04	57 88	101·43	Decided	Decided.
·9516	·9509	·0007	3 06	34·10	40 84	71·58	Faint	None.
9405	·9370	0035	4·66	41·30	48·75	85·43	"	Faint.
·9223	·9168	·0055	20·56	50·61	58 45	102·43	Decided	Decided.
·9263	·9245	0018	5·56	47·14	54·90	96·21	Faint	Faint.
·9231	·9208	·0025	7·28	48·82	56·63	99 24	Decided	Decided.
·9481	9457	·0024	6·56	36·72	43 75	76·67		
·9430	·9355	·0075	21·18	42·05	49 55	86·84	"	"
·9491	·9473	·0018	2·70	35·85	42 78	74 97	Faint	Faint.
·9461	·9436	·0025	4·76	37·89	45 04	78·93	Decided	Decided.
·9394	·9366	·0028	8·72	41·50	48·97	85·81	"	"
·9388	·9349	·0039	8·07	42·33	49 86	87·37	"	"

The solid matter amounts to 20 grammes per litre in 3 samples.
" " " 15 " " 3 "
" " " 10 " " 6 "
" " " 5 " " 8 "
" " is less than 5 " " 10 "

APPENDIX G.

BULLETIN No. 93--MILK, 1903.

OTTAWA, February 3, 1904.

W. J. GERALD, Esq.,
Deputy Minister of Inland Revenue.

SIR,—I beg to submit herewith a tabulated statement giving the results of examining 227 samples of milk collected, in accordance with your instructions, in the months of November and December, 1903 The statement gives full particulars regarding the origin of each sample. Three of them were found on analysis to contain over 6 per cent of butter fat and were therefore regarded as 'partly cream.' Deducting these, the remaining 224 samples may, according to their qualities, be classified as follows:—

Genuine or unadulterated	159
Watered	15
Skimmed	2
Partly skimmed	6
Under average in total solids	9
" " butter fat	13
" " non-fatty solids	20
Total	224

When compared with former collections, the one now being reported shows about the same relative proportions of the various qualities as in 1895, and an improvement over the collections of 1897 and 1901.

The figures are as follows :—

	November and December, 1895.	September and October, 1897.	September and October, 1901.	November and December, 1903.
	Per cent.	Per cent.	Per cent.	Per cent.
Genuine	70·8	65·0	63·7	70·9
Watered	4·2	4·4	1·3	6·7
Skimmed			0·6	0·9
Partly skimmed	2·7	6·6	2·5	2·7
Under average	22·3	24·0	31·9	18·8
	100·0	100·0	100·0	100·0

The following table shows where the samples were obtained, and their qualities in each place :—

Locality.	Genuine.	Watered.	Skimmed.	Partly Skimmed.	Under Average.	Total.
Halifax, N.S.	10	0	0	0	4	14
Springhill	2	0	0	0	2	4
Amherst	1	0	0	0	0	1
Truro	2	0	0	0	1	3
Dartmouth	1	1	0	0	0	2
Charlottetown, P.E.I.	7	0	0	0	2	9
Summerside	1	0	0	0	1	2
St. John, N.B.	10	1	0	0	2	13
Sussex	1	0	0	1	0	2
Campbellton	2	0	0	0	1	3
Moncton	2	0	0	0	2	4
St. Hyacinthe, P.Q.	6	0	0	0	0	6
Drummondville	3	0	0	0	0	3
Arthabaska	1	0	0	0	1	2
Richmond	1	0	0	0	1	2
Victoriaville	2	0	0	0	0	2
Sherbrooke	3	1	0	0	0	4
Farnham	1	0	0	0	0	1
Granby	2	0	0	0	0	2
Sutton	1	0	0	0	0	1
St. Lambert	2	0	0	0	2	4
Montreal	18	1	0	2	3	24
Kingston, Ont.	9	2	0	0	1	12
Perth	3	0	0	0	0	3
Ottawa	10	0	0	1	0	11
Toronto	11	4	0	0	3	18
Hamilton	4	0	0	0	2	6
Goderich	3	0	0	0	0	3
Seaforth	3	0	0	0	0	3
Stratford	2	0	0	0	1	3
London	5	0	0	0	0	5
St. Thomas	2	0	0	0	2	4
Woodstock	2	1	0	0	0	3
Virden, Man.	1	0	0	0	0	1
Brandon	1	0	0	1	2	4
Winnipeg	8	2	2	0	1	13
Penoka Alta.	0	0	0	0	1	1
Wetaskiwin	0	0	0	0	1	1
Edmonton	2	0	0	0	1	3
Calgary	1	0	0	1	2	4
Vancouver, B.C.	4	1	0	0	1	6
New Westminster	2	0	0	0	1	3
Victoria	4	1	0	0	1	6
Nanaimo	3	0	0	0	0	3
	159	15	2	6	42	224

If a comparison be made between the collections of 1895, 1897 and 1903 by localities, and the percentages of genuine samples calculated for those places in which samples were taken on all these occasions, the following results are obtained :—

PERCENTAGE OF GENUINE SAMPLES.

	1895.	1897.	1903.		1895.	1897.	1063.
	Per cent.	Per cent.	Per cent.		Per cent.	Per cent.	Per cent.
Halifax, N.S.	66·6	75·0	71·4	St. Hyacinthe	100·0	100·0	100·0
St. John, N.B.	31·3	91·0	76·9	Ottawa, Ont.	62·5	64·3	100·0
Sussex	33·3	100·0	50·0	Toronto	50·0	31·2	61·1
Moncton	100·0	66·6	50·0	London	66·6	77·7	100·0
Sherbrooke, P.Q.	100·0	50·0	75·0	Stratford	100·0	100·0	100·0
Montreal	72·7	68·7	75·0	St. Thomas	100·0	50·0	50·0
				Winnipeg, Man.	72·2	73·7	61·0

I have the honour to be, sir, your obedient servant,

THOMAS MACFARLANE, *Chief Analyst.*

TABULATED STATEMENT of the

Date of Collection.	No. of Sample.	Name and Address of Analyst.	Quantity.	Cost.	Name and Address of Furnisher.
1903.		*District of Halifax.*		$ cts.	
Nov. 19..	20391	C. W. Drysdale, Halifax, N.S...	1 pint .	0 05	Brought into city by train daily—Unknown.
" 19..	20392	Scotia Pure Milk Co. " ..	1 " ..	0 05	L. Mumford, Shediac .....
" 19..	20393	" " ..	1 " ..	.....	P. Grant, Lower Stewiacke.....
" 19..	20394	" " ..	1 " ..	.....	J. J. Gourley " .....
" 19..	20395	J. S. Power " ..	1 " ..	0 03	H. Grant, Halifax .....
" 19..	20396	James Hogan " ..	1 " ..	0 03	C. W. Drysdale, Halifax .....
" 19..	20397	Wm. Forsyth " ..	1 " ..	0 03	Wm. Smith, Halifax. Brought into city by train.
" 19..	20398	" " ..	1 " ..	0 03	Scotia Pure Milk Co., City. Sold as pasteurized milk.
" 20..	20399	Scotia Pure Milk Co. " ..	1 " ..	0 03	Scotia Pure Milk Co .....
" 20..	20400	H. Burgess " ..	1 " ..	0 03	Brought into city by train and taken from delivery wagon.
" 20..	20401	G. A. Fraser " ..	1 " ..	0 03	" " ..
" 20..	20402	W. C. Mountain " ..	1 " ..	0 04	Jas. Mountain, Halifax.....
" 20..	20403	P. Lowrie " ..	1 " ..	0 04	Jas. Murray " .....
" 20..	20404	Walter Payne " ..	1 " ..	0 03	Scotia Pure Milk Co., Halifax....
" 20..	20405	E. A. Bent, Springhill, N.S.....	1 " ..	0 03	Vendor.....
" 20..	20406	James Nelson "	1 " ..	0 03	" .....
" 26..	20407	R. Boss "	1 " ..	0 03	" .....
" 26..	20408	Frank Mills "	1 " ..	0 03	" .....
" 26..	20411	H. E. Miner, Restaurantkeeper, Amherst, N.S.	1 " ..	0 05	M. Pipes, Amherst.....
" 27..	20412	L. R. Dunlop, Truro, N.S.....	1 " ..	0 03	Vendor.....
" 27..	20413	W. H. Snook & Co., Shopkeeper, Truro, N.S.	1 " ..	0 03	L. R. Dunlop, Truro .....
" 27..	20414	G. H. Barnhill, Truro, N.S.....	1 " ..	0 03	Vendor.....
" 30..	20417	Frank Dare, Dartmouth, N.S ...	1 " ..	0 03	Pure Milk Co., Halifax (pasteurized)
" 30..	20418	Mrs. Griffin, Shopkeeper, Dartmouth, N.S.	1 " ..	0 03	Geo. Bell, Coal Harbour. .....
		District of Prince Edward Island.			
Dec. 2..	4375	Victor Mackinnon, Charlottetown, P.E.I.	1 " ..	0 03	Vendor.....
" 2..	4376	Roger Farquharson, Charlottetown, P.E.I.	1 " ..	0 03	" .....
" 2..	4377	A. McMillan, Brackley Point Road.	1 " ..	0 03	" .....
" 2..	4378	Wallace Wheatley, Royalty	1 " ..	0 03	" .....
" 2..	4379	M. Matheson, St. Peter's Road..	1 " ..	0 03	" .....
" 2..	4380	James Pickard, Royalty, P.E.I..	1 " ..	0 03	" .....
" 2..	4381	Wm. Millar, Marshfield.....	1 " ..	0 03	" .....
" 2..	4382	J. M. Price, Summerside.....	1 " ..	0 03	" .....
" 2..	4383	Joseph McNeill "	1 " ..	0 03	" .....
" 2..	4384	Wm. Pickering "	1 " ..	0 03	" .....
" 2..	4386	E. Cameron, Charlottetown.....	1 " ..	0 03	J. Roper, Charlottetown, P.E.I...
" 2..	4387	" "	1 " ..	0 03	Donald McMillen " ...
		District of New Brunswick.			
Nov. 18..	17976	Fred. Hanna, Milledgeville, N.B.	3 8-oz. bottles.	0 06	Vendor.....
" 18..	17977	Dunlop & Croakes, 24 St. Germain St., St. John.	" ..	0 06	Stanley Ward, St. John North.....
" 18..	17978	E. Foster, Milledgeville Road, St. John Co.	" ..	0 06	Vendor.....
" 18..	17979	Harry M. Floyd, 38 Sydney St., St. John, N.B.	" .	0 06	McIntyre Bros., Sussex, N.B ...

SESSIONAL PAPER No. 14

Inspection of Whole Milk.

Result of Analysis.					Analyst.	Remarks by the Analyst.
Specific Gravity at 15·5 c.	Water.	Butter Fat.	Other Solids.	Total Solids.		
	p. c.	p. c.	p. c.	p. c.		
1·0300	88·15	3·83	8·03	11·85	M. Bowman	Below average in solids not fat.
1·0317	86·83	4·31	8·86	13·17	"	Genuine.
1·0307	88·45	3·26	8·29	11·55	"	Below average in butter fat.
1·0303	86·93	4·63	8·44	13·07	"	Genuine.
1·0302	88·15	3·29	8·56	11·85	"	Below average in butter fat.
1·0302	88·73	3·11	8·16	11·27	"	" and low solids.
1·0334	86·63	4·15	9·12	13·37	"	Genuine.
1·0314	87·32	3·98	8·70	12·68	"	"
1·0310	87·48	4·02	8·50	12·52	"	"
1·0295	87·62	4·03	8·35	12·38	"	"
1·0304	87·74	3·75	8·51	12·26	"	"
1·0319	87·69	3·52	8·79	12·31	"	"
1·0310	86·92	4·48	8·60	13·08	"	"
1·0308	87·55	3·95	8·50	12·45	"	"
1·0308	86·46	4·76	8·75	13·54	"	"
1·0333	84·81	5·70	9·47	15·19	"	"
1·0292	88·38	3·68	7·94	11·62	"	Below average in solids not fat.
1·0288	87·99	4·02	7·99	12·01	"	"
1·0323	86·96	4·31	8·73	13·04	"	Genuine.
1·0323	86·00	5·03	8·97	14·00	"	"
1·0320	88·21	3·30	8·40	11·79	"	Below average in butter fat.
1·0327	86·59	4·46	8·95	13·41	"	Genuine.
1·0310	87·41	3·98	8·61	12·59	"	"
1·0237	89·86	3·38	6·76	10·14	"	Watered and therefore adulterated.
1·0296	87·46	4·14	8·40	12·54	T. Macfarlane	Genuine.
1·0334	88·16	3·67	8·17	11·84	"	Under average in total solids.
1·0324	86·60	4·77	8·63	13·40	"	Genuine.
1·0324	87·05	4·55	8·40	12·95	"	"
1·0314	87·40	4·20	8·40	12·60	"	"
1·0314	86·35	5·03	8·62	13·65	"	"
1·0304	87·46	4·40	8·14	12·54	"	Under average in non-fatty solids.
1·0324	88·70	3·37	7·93	11·30	"	Under average in total solids.
1·0327	87·78	3·69	8·53	12·22	"	Genuine.
1·0327	84·89	6·36	8·75	15·11	"	Partly cream.
1·0327	87·04	4·26	8·70	12·96	"	Genuine.
1·0327	87·05	4·28	8·67	12·95	"	"
1·0224	90·61	3·16	6·23	9·39	J. G. A. Valin	Watered, therefore adulterated.
1·0324	86·82	4·13	9·05	13·18	"	Genuine.
1·0344	87·17	3·51	9·32	12·83	"	"
1·0324	87·49	3·55	8·96	12·51	"	"

TABULATED STATEMENT of the

Date of Collection.	No. of Sample.	Name and Address of Vendor.	Quantity.	Cost.	Name and Address of Furnisher.
		District of New Brunswick—Con.		$ c.	
Nov. 19..	17980	E. A. McCauley, 173 Princess St., St. John.	8-oz. bottles.	0 05	C. B. McCready, Apohaqui, N.B..
" 19..	17981	T. Robinson, 39 Garden St., St. John, N.B.	" ..	0 05	Robert Robinson, Sussex, N. B....
" 19..	17982	D. M. Lawson, 182 Britain St...	" ..	0 05	J. A. Patterson, Apohaqui, N.B...
" 19..	17983	R. W. Wigmore, 158 Pond St., St. John.	" ..	0 05	Sussex Milk and Cream Co., Sussex, N.B.
" 19..	17984	Public Hospital, Waterloo St., Thos. H. Lunney, M.D., St. John, N. B.	" ..	Nil...	A. E. McCauley, St. John, N.B...
" 20..	17985	J. H. Case, 24 Waterloo St., Halifax.	" ..	0 06	S. Creighton, Silver Falls, N.B....
" 20..	17986	Jas. W. Brogan, 16 Brussels St., St. John.	" ..	0 06	Andrew Gibson, Red Head, N.B ..
" 26..	17990	Major H. Green, Milledgeville Road, St. John, N.B.	" .	0 06	From vendor's dairy .. . .
" 26..	17991	Thompson Bros., Manawagonish Road, Lancaster Parish, St. John Co.	" ..	0 06	" .....
Dec. 7..	17992	Sussex Milk Co., Sussex, King's Co., at Milk Depot, Broad St., James Lamb, manager.	"	0 06	Hugh Aiton, Sussex Corner, Sussex Co.
" 7..	17993	" " ..	" ..	0 06	David Robinson, Sussex, King's Co.
" 7..	17994	" " .	" ..	0 06	David Aiton, Lower Cove, Sussex, King's Co.
" 7.	17995	Thos. R. Duncan, Campbellton..	" ..	0 05	Vendor..... .....
" 7..	17996	A. F. Chamberlain " ..	" ..	0 05	" .....
" 7..	17997	Angus McKenzie " ..	" ..	0 05	John Mair, Campbellton .....
" 7..	17998	David W. Doherty " ..	" ..	0 06	Vendor..... .....
" 12..	23801	Albert J. Steeves, Bridgedale....	" ..	0 05	" ....
" 12..	23802	F. H. Trites, Sunnybrae..... ...	" ..	0 05	" ....
" 12..	23803	E. H. Hopper, Shediac Road, Moncton, N.B.	" ..	0 05	" . ...
" 12..	23804	Beaton & Co., City Market, Moncton, N.B.	" ..	0 10	Gurney R. Jones, Lewisville, Moncton Parish.
		District of Quebec.			
Nov. 23..	24701	Louis Carrière, 72 St. Pascal St., St. Hyacinthe.	1 pint..	0 03	....
" 23..	24702	Pierre Sabourin, St. Hyacinthe le Confesseur.	" ..	0 03	... ...
" 23..	24704	Amb. Chinette, St. Hyacinthe...	" ..	0 03	....
" 23..	24705	F. X. Blanchard, St. Hyacinthe le Confesseur.	" ..	0 03	....
" 23..	24703	P. Labonte, St. Hyacinthe.....	" ..	0 04	Jacques Boulay, St. Thomas d'Aquin
" 23..	24706	J. B. Laplante "	" ..	0 03	....
" 23..	24707	M. Cardin, Drummondville.....	" .	0 03	....
" 23..	24708	R. Cardin "	" ..	0 03	... .
" 23..	24709	X. Lemaire "	" ..	0 03	.. ..
" 23..	24710	L. Lajoie, Actonvale	" ..	0 03	....
" 23..	24711	Laurent Plante, Actonvale	" .	0 03	... .
" 25..	24712	C. N. Evans, Richmond.....	" ..	0 03	....
" 25.	24713	W. H. McLaughlin, Richmond..	" ..	0 03	.. ..
" 25..	24714	Amedé Mathieu, St. Victoire, d'Arthabaska.	" ..	0 04	....
" 25..	24715	Joseph Dussault, Victoriaville...	" .	0 03	....
" 25..	24716	Felix Vanier, Sherbrooke.....	" ..	0 03	....
" 25	24717	Richard Armitage, Sherbrooke...	" .	0 03	... .
" 25..	24718	David Lefebvre, 3rd Concession of Sherbrooke.	" ..	0 03	....
" 25 .	24719	W. J. Hunt, Sherbrooke.....	" ..	0 05	J. W. Bilton, Sherbrooke..... ....

Inspection of Whole Milk.

Result of Analysis.					Analyst.	Remarks by the Analyst.
Specific Gravity at 15·5 c.	Water.	Butter Fat.	Other Solids.	Total Solids.		
	p. c.	p. c.	p. c.	p. c.		
1·0324	87·23	3·53	9·24	12·77	J. G. A. Valin.....	Genuine.
1·0314	86·26	4·38	9·36	13·74	.....	
1·0324	87·59	3·20	9·21	12·41	....	Under average in total solids.
1·0327	87·43	3·77	8·80	12 57	.....	Genuine.
1·0342	86 98	4·04	8·98	13·02	.... ..	
1·0622	85·66	1 73	9·61	14·34	.....	
1 0322	87 80	3 28	8·72	12·20	... .	Under average in total solids.
1 0316	87·69	3·67	8·64	12·31	A. Lemoine.	Genuine.
1 0326	87·28	3 71	9 01	12·72	.....	
1·0526	88 44	2 43	9 13	11·56	Miss S. E. Wright	Partly skimmed, therefore adulterated.
1·0306	84·51	6·24	9 25	15·49		Partly cream.
1·0306	85·56	5·00	9·44	14·44	..	Genuine.
1 0272	84·55	6 99	8·46	15·45	.	Partly cream.
1·0322	86·40	4·43	9·17	13·60	..	Genuine.
1·0292	88·20	3·71	8·09	11·80	. .	Under average in total solids.
1·0292	86·59	5·24	8·17	13·41	.. .	Genuine.
1·0272	88·03	4·14	7·83	11·97		Under average in non-fatty solids.
1·0252	88·37	4·49	7·14	11 63	..	
1·0302	86·83	4·50	8 67	13·17		Genuine.
1·0252	86·90	4·49	8·61	13·10		
1 0328	86·98	4·06	8·96	13 02	J. G. A. Valin	Genuine.
1 0335	86·60	4 27	9 13	13 40	.....	
1 0305	86 24	4·72	8 94	13·66	Miss S. E. Wright	
1 0295	86·26	4·50	9 14	13 64	.....	
1·0305	86·61	4·22	9·07	13·29	... ..	
1 0316	86·94	3 74	9·22	12·96	..	
1 0254	87 11	4·48	8·35	12·79	.	
1·0285	86·65	4·24	9·01	13·25	. . .	
1·0285	84·86	4·80	10 24	15·04	.. .	
1·0295	85·98	4·85	9·09	13·92	.	
1·0305	87·96	3·20	8 74	11·94	..	Under average in total solids.
1·0295	88·26	3·16	8·48	11·64	..	
1·0285	87.03	3·98	8·89	12·87	.	Genuine.
1 0316	85·93	4·54	9·43	13·97	.	
1·0326	86·05	3·97	9 88	13·85	. ...	
1·0204	91·17	3·03	5·70	8·73	.. . ...	Watered, therefore adulterated.
1·0305	87·04	3·85	9·01	12·86	. ...	Genuine.
1·0295	86 08	4 67	9·15	13·82	. ..	
1 0316	86·31	4·21	9·38	13·59	. .	

TABULATED STATEMENT of the

Date of Collection.	No. of Sample.	Name and Address of Vendor.	Quantity.	Cost.	Name and Address of Furnisher.
		District of Quebec—Continued.		$ cts.	
Dec. 1..	24720	Alf. Guerin, Farnham.....	1 pint..	0 03	Vendor.....
" 1..	24721	F. W. Roberts, Granby.....	1 " ..	0 03	" .....
" 2..	24722	T. Arrowsmith, Granby.....	1 " ..	0 03	" .....
" 2..	24723	A. A. Robinson, Sutton.....	1 " ..	0 03	" .....
" 3..	24724	J. Smith, St. Lambert.....	1 " ..	0 04	" .....
" 7..	24725	E. C. Holland, St. Lambert.....	1 " ..	0 04	" .....
" 7	24726	M. St. Yves, St. Lambert.....	1 " ..	0 04	" .....
" 7	24727	P. St. Marie, St. Lambert.....	1 " ..	0 04	" .....
		District of Montreal.			
Nov. 18..	23464	L. Dussault, 317 Delisle St., St. Cunegonde.	1 " ..	0 05	.....
" 18..	23465	G. G. Lyster, 146 Mountain St., Montreal.	1 " ..	0 04	J. S. Lyster, Richmond, Que.....
" 18..	23466	Park Bros., Montreal West.....	1 " ..	0 04	.....
" 18..	23467	Luke Prudhomme, Côte St. Luc	1 " ..	0 04	.....
" 18..	23468	Geo. Smith, 14 Laurier St., St. Henri.	1 " ..	0 04	J. Smiley, Richmond, Que.....
" 18..	23469	W. F. Little, 17 Plateau St., Montreal.	1 " ..	0 04	Geo. Biggar, Huntingdon.....
" 18..	23470	A. Papineau, 64 Turgeon St., S. Henri.	1 " ..	0 04	.....
" 18..	23471	James Clarke, 4 Atwater Ave., St. Henri.	1 " ..	0 04	.....
" 18..	23472	Louis Geoffrion, 196 Richelieu St., St. Cunegonde.	1 " ..	0 04	.....
" 18..	23473	A. Messier, 292 Delisle St., St. Cunegonde.	1 " ..	0 04	.....
" 20..	23474	H. W. Evans, Blue Bonnets.....	1 " ..	0 04	Taken at office of vendor as ready for sale, put up in pint bottles.
" 20..	23475	Standard Dairy Co., 671 Lagauchetière St., Montreal.	1 " ..	0 04	Taken on street from can in vendor's wagon.
" 20..	23476	J. B. Thompson, Petit Cote.....	1 " ..	0 04	" "
" 20..	23477	James Muir, St. Laurent.....	1 " ..	0 04	" "
" 20..	23478	Guaranteed Pure Milk Co., St. Catherine St., Montreal.	1 " ..	0 04	" "
" 20.	23479	Geo. Duncan, 35 Selby St., Westmount.	1 " ..	0 04	" "
" 20..	23480	Thos. Couray, Hillside Avenue, Westmount.	1 " ..	0 04	" "
" 20.	23481	L. Larivière, Cartierville.....	1 " ..	0 04	" "
" 20..	23482	Geo. H. Brown, 11 Broche Ave., Westmount.	1 " ..	0 04	" "
" 20..	23483	J. P. Côté, 532 St. Dominique St., Montreal.	1 " ..	0 04	.....
" 20..	23484	Standard Dairy Co., 671 Lagauchetière St., Montreal.	1 " ..	0 04	T. E. Booth, Waterloo St.....
" 20..	23485	Guaranteed Pure Milk Co., Montreal.	1 " ..	0 04	C. S. Campbell, Dorval.....
" 20..	23486	" "	1 " ..	0 04	R. R. Ness, Howick.....
" 20..	23487	" "	1 " ..	0 04	.....
		District of Kingston.			
Nov. 25..	21456	The Clarified Milk Co., Kingston	1 " ..	0 05	Taken from wagon on street while delivering.
" 25..	21457	T. McQuay, Kingston Junction..	1 " ..	0 05	" "
" 25..	21458	J. G. Porter, Cataraqui.....	1 " ..	0 05	.....
" 25.	21459	O. McMichael, Cataraqui	1 " ..	0 05	.....

SESSIONAL PAPER No. 14

Inspection of Whole Milk—*Continued.*

Result of Analysis.					Analyst.	Remarks by the Analyst.
Specific Gravity at 15°c.	Water.	Butter Fat.	Other Solids.	Total Solids.		
	p. c.	p. c.	p. c.	p. c.		
1·0316	86·74	4·48	8·78	13·26	A. Lemoine.	Genuine.
1·0324	87·22	3·97	8·81	12·78	T. Macfarlane	"
1·0334	86·45	4·36	9·19	13·55	"	"
1·0334	86·61	4·20	9·19	13·39	"	"
1·0327	87·01	4·17	8·82	12·99	"	"
1·0306	88·20	3·68	8·12	11·80	"	Under average in non-fatty solids.
1·0256	87·17	5·64	7·19	12·83	"	"
1·0347	87·21	3·65	9·14	12·79	"	Genuine.
1·0320	87·82	4·01	8·17	12·18	Dr. J. T. Donald	
1·0333	86·18	5·16	8·66	13·82	"	"
1·0340	88·52	3·09	8·39	11·48	"	Doubtful, under average in butter fat.
1·0363	86·17	4·52	9·31	13·83	"	Genuine.
1·0340	87·19	4·17	8·64	12·81	"	"
1·0341	87·12	4·15	8·73	12·88	"	"
1·0330	87·35	4·17	8·48	12·65	"	"
1·0338	85·93	4·34	9·73	14·07	"	"
1·0320	87·65	3·86	8·49	12·35	"	"
1·0324	87·34	4·04	8·62	12·66	"	"
1·0300	88·43	3·54	8·03	11·57	"	Low in solids not fat.
1·0311	88·10	3·87	8·03	11·90	"	Under average in solids not fat.
1·0353	88·04	2·90	9·06	11·96	"	Partly skimmed.
1·0339	87·50	3·54	8·96	12·50	"	Genuine.
1·0356	88·26	2·85	8·89	11·74	"	Partly skimmed.
1·0327	86·87	4·67	8.46	13·13	"	Genuine.
1·0332	86·82	4·03	9·15	13·18	"	"
1·0264	89·46	3·31	7·23	10·54	"	Low in solids and fat, probably watered.
1·0345	87·21	3·84	8·95	12·79	"	Genuine.
1·0340	86·76	4·37	8·93	13·30	"	"
1·0300	86·92	4·61	8·47	13·08	"	"
1·0320	87·19	4·11	8·70	12·81	"	"
1·0332	87·14	3·89	8·97	12·86	"	"
1·0331	87·29	3·91	8·80	12·71	"	"
1·0285	89·01	3·05	7·94	10·99	Miss S. E. Wright	Slightly watered, therefore adulterated.
1·0316	86·52	4·34	9·14	13·48	"	Genuine.
1·0254	90·24	2·64	7·12	9·76	"	Watered, therefore adulterated.
1·0295	85·92	3·90	10·18	14·08	"	Unadulterated.

TABULATED STAEMENT of the

Date of Collection.	No. of Sample.	Name and Address of Vendor.	Quantity.	Cost.	Name and Address of Furnisher.
1903.		*District of Kingston*—Continued.		$ cts.	
Nov. 25..	21460	F. X. Theriault, Kingston Junction.	1 pint..	0 05	.....
" 25..	21461	E. Ferrier, Williamsville	1 " ..	0 05	.....
" 25..	21462	Joseph Morton, Kingston Junction.	1 " ..	0 05	.....
" 25..	21463	John Gillespie, Barriefield.....	1 " .	0 05	.....
" 25..	21464	A. E. Weller, Kingston Junction	1 " ..	0 05	.....
" 25..	21465	The Clarified Milk Co., Kingston	1 " ..	0 05	Taken from factory, in stock as supplied by W. Gardner, Perth Road.
" 25..	21466	" "	1 " ..	0 05	Taken at factory from a quart bottle in stock as prepared for delivery to customers.
" 25..	21467	F. P. Grass, Albert St., Kingston	1 " .	0 05	.....
" 26..	21468	James T. Watt, Perth, Ont.....	1 " .	0 05	Taken from wagon on street .....
" 26..	21469	John Brady, Perth.....	1 " ..	0 05	" " " .....
" 26..	21470	H. J. Chaplin, Perth	1 " ..	0 05	" " " ...
" 27..	21471	Wm. Warnock, Cummings B'dge, Ottawa.	1 " ..	0 05	" " " .....
" 27..	21472	Ottawa Dairy Co., Ottawa.....	1 quart.	0 06	" " " (No. 19)
" 27..	21473	R. Ormond, Cummings Bridge..	1 " ..	0 03	" " " .....
" 27..	21474	J. Craig, Cummings Bridge.	1 pint..	0 03	" " " .....
" 27..	21475	Arthur Grimes, Aylmer, P.Q....	1 " .	0 05	" " " .....
" 27..	21476	Ottawa Dairy Co., Ottawa.....	1 quart.	0 06	" " " (No. 16)
" 27..	21477	P. Clarke, Albert St., Ottawa...	1 " ..	0 06	Taken at factory, put up in bottle ready for delivery.
" 27..	21480	Ottawa Dairy Co., Ottawa.....	1 pint..	0 03	Scobie & Fee, taken after clarification.
" 27..	21481	" " " ..	1 " ..	0 03	Scobie & Fee, taken before clarification.
" 27..	21482	" " " ..	1 " ..	0 03	J. McKellar, taken after clarification.
" 27..	21483	" " " ..	1 " ..	0 03	J. McKellar, taken before clarification.
		Toronto District.			
Dec. 2..	23257	Geo. Pope, 204 Victoria St., Tor.	1 pint..	0 03	Taken from wagon on street.....
" 2..	23258	W. Bawden, 1234 College "	1 " ..	0 03	" " " .....
" 2..	23259	A. Arnold, 685 Yonge "	1 " ..	0 03	" " " .....
" 2..	23260	Miss Flauley, 278 Church "	1 " .	0 03	Taken at store of vendor.....
" 2..	23261	John Cranston, 245 " "	1 " ..	0 03	Woburn Dairy .....
" 2..	23262	W. J. Campbell, 421 Yonge St., Toronto, Union Dairy Co.	1 " ..	0 03	Taken at dairy of vendor.....
" 2..	23263	Richard Doughty, Bedford Park, Toronto.	1 " ..	0 03	From wagon on street .....
" 2..	23264	Richard Doughty, Bedford Park, Toronto.	1 " .	0 03	Vendor's farm.....
" 2..	23265	S. J. Peacock, 82 Power St., Tor.	1 " ..	0 03	Taken at vendor's dairy.....
2..	23266	S. Price & Sons, Ltd., 217 King St., E., Toronto.	1 " ..	0 03	From bottled stock.....
2..	23267	S. Price & Sons, Ltd., 217 King St., E., Toronto.	1 " .	0 03	James Moffatt, Wexford, before pasteurising.
" 3..	23268	A. Cowley, 289 Queen St., Toronto	1 " ..	0 03	Taken at vendor's dairy.....
" 3..	23269	James R. Hambridge, 273 Queen St., Toronto.	1 " ..	0 03	.....
" 3	23272	S. Price & Sons, Ltd., 217 King St. E., Toronto.	1 " ..	0 03	James Darlington, Wexford; before being pasteurized.
" 3..	23270	City Dairy Co., Toronto.....	1 " ..	0 03½	R. M. Loveless, Agincourt.....
" 3..	23271	" " "	1 " ..	0 03½	Jas. Montgomery, Streetsville. ...
" 3..	23273	" " "	1 " ..	0 03½	As the milk ran through pasteurizing machine.
3..	23274	" "	1 " ..	0 03½	As bottled ready for sale.....

SESSIONAL PAPER No. 14

Inspection of Whole Milk—*Continued.*

Result of Analysis.					Analyst.	Remarks by the Analyst.
Specific Gravity at 15·5 C.	Water.	Butter Fat.	Other Solids.	Total Solids.		
	p.c.	p.c.	p.c.	p.c.		
1·0275	88·31	3·77	7·92	11·69	Miss S. E. Wright	Under average in non-fatty solids.
1·0305	86·62	4·37	9·01	13·38	"	Genuine.
1·0295	87·55	3·71	8·74	12·45	"	"
1·0305	86·81	4·15	9·04	13·19	"	"
1·0254	86·70	4·40	8·90	13·30	"	"
1·0285	87·01	3·83	9·16	12·99	"	"
1·0275	87·84	3·75	8·41	12·16	"	"
1·0285	86·83	4·23	8·94	13·17	"	"
1·0295	87·39	3·88	8·73	12·61	"	"
1·0295	86·50	4·47	9·03	13·50	"	"
1·0295	86·74	3·89	9·36	13·25	"	"
1·0316	88·52	2·64	8·74	11·38	"	Partly skimmed, transferred to adlt'd.
1·0316	87·20	3·77	8·93	12·70	"	Genuine.
1·0295	87·13	3·64	9·13	12·77	"	"
1·0285	86·05	4·58	9·27	13·85	"	"
1·0316	87·00	4·67	8·23	12·90	"	"
1·0305	87·41	3·63	8·86	12·49	"	"
1·0295	85·55	4·79	9·56	14·35	"	"
1·0295	87·05	3·89	9·06	12·95	"	"
1·0305	87·16	3·87	8·97	12·84	"	"
1·0316	87·05	3·62	9·33	12·95	"	"
1·0316	86·88	3·74	9·38	13·12	"	"
1·0290	89·46	3·25	7·19	10·44	Dr. W. H. Ellis	Adulterated by addition of water.
1·0330	87·80	3·58	8·62	12·20	"	Genuine.
1·0330	88·05	3·48	8·47	11·95	"	"
1·0290	89·83	2·55	7·62	10·17	"	Adulterated by addition of water.
1·0310	88.83	3·52	7·65	11·17	"	Under average in total solids.
1·0310	88·79	3·48	7·73	11·21	"	" " "
1·0340	86·84	4·19	8·97	13·16	"	Genuine.
1·0340	86·64	4·53	8·83	13·36	"	"
1·0280	89·53	3·01	7·46	10·47	"	Adulterated by addition of water.
1·0310	88·85	3·16	7·99	11·15	"	Under average in solids.
1·0330	87·66	3·53	8·81	12·34	"	Genuine.
1·0320	87·47	4·15	8·38	12·53	"	"
1·0300	89·20	3·14	7·66	10·80	"	Adulterated by addition of water.
1·0340	87·60	3·48	8·92	12·40	"	Genuine.
1·0340	86·97	3·99	9·04	13·03	"	"
1·0320	87·29	4·11	8·60	12·71	"	"
1·0330	87·53	3·73	8·71	12·47	"	"
1·0330	87·83	3·56	8·61	12·17	"	"

TABULATED STATEMENT of the

Date of Collection.	No. of Sample.	Name and Address of Vendor.	Quantity	Cost.	Name and Address of Furnisher.
		Toronte District—Concluded.		$ cts.	
Dec. 4..	23275	D. Duncan Waterdown, Hamilton	1 " ..	0 03	From wagon on street .....
" 4..	23276	J. O. Ryckman, 87 Victoria St., Hamilton.	1 " ..	0 03	" " .....
" 4..	23277	Chas. Cochrane, Hamilton.	1 " ..	0 03	" " (No. 84). ...
" 4..	23278	G. Hamilton, 223 E. Av., Hamilton	1 " .	0 03	" " .....
" 4..	23279	Pure Milk Corporation, " .	1 " ..	0 03	Taken on premises before being sterilized.
" 4..	23280	" " " .	1 " ..	0 03	After it has been through machine.
		London District.			
Nov. 24..	22160	John Porter, Goderich.....	1 quart.	0 06	Vendor, collected on street.. .....
" 24..	22161	Samuel Bisset, "	1 " ..	0 06	" " .....
" 24..	22162	John Beattie, "	1 " ..	0 06	" " .....
" 25..	22163	Hugh Greeves, Tuckersmith Township, collected in Seaforth.	1 " ..	0 03	Vendor, bottled milk.....
" 25..	22164	Daniel Grunnet, Seaforth.	1 " ..	0 03	" " .....
" 25..	22165	Joseph Brown, McKillop Township, collected in Seaforth.	1 " ..	0 03	" " .....
" 30..	22166	Phillip Cornish, Stratford.....	1 " ..	0 03	Collected from sleigh in Stratford..
" 30..	22167	R. S. Beattie, Ellis Township, Stratford P.O.	1 " ..	0 03	" " " ..
Nov. 30..	22168	A. J. Clarke, Downey Township, Stratford P.O.	1 quart..	0 06	Vendor, collected from milk sleigh in Stratford.
Dec. 1..	22169	J. Foster & Sons, Westminster Township, London.	" ..	0 06	" " ..
" 1..	22170	G. Tupholme, London	" ..	0 05	" " ..
" 1..	22171	W. J. Walker "	" ..	0 05	" " .
" 1..	22172	Arthur Wilson "	" ..	0 05	From milk wagon on street.....
" 1..	22173	William McKone, Albert Avenue, London.	" .	0 05	" " .....
Nov. 30..	22175	Fred Cheplow, St. Thomas	.....	...	Vendor .....
Dec. 1..	22176	J. A. Small "	.....	....	" .....
" 1.	22177	Fred. Carr " ..	.....	.....	From large can in wagon on street in St. Thomas.
" 1..	22178	Simon Kelly "	.....	..	" " ..
" 1..	22179	T. H. Dent, Woodstock.....	.. ..	.....	Vendor .....
" 1..	22180	John Masson "	.....	.....	John Speck, Woodstock, and John Dunn, East York.
" 1..	22181	George Masson "	.....	...	Vendor ....
		Winnipeg District.			
Nov. 20..	23901	John Bain, Virden, Man	1 pint ..	0 05	... .
" 20..	23902	G. Coombes, Brandon, Man.....	" ..	0 05	.....
" 20..	23903	Brandon Dairy Co., Brandon, Man	" ..	0 05	.....
" 20..	23904	J. White, Brandon, Man.....	" ..	0 05	.....
" 20..	23905	Brandon Creamery Supply Co...	" ..	0 05	.....
" 20..	23906	C. V. Walleghen, Winnipeg, Man	" ..	0 05	.....
" 20..	23907	P. Gaspas, St. Boniface, Man..	" ..	0 05	.....
" 20..	23908	Winnipeg Pure Milk Co	" ..	0 05	.....
" 20..	23909	S. Eddleston, Winnipeg, Man. .	" ..	0 05	.....
" 23..	23910	Wm. Cummings, Winnipeg, Man	" ..	0 05	.....
" 23..	23911	A. Pauquerin " ..	" ..	0 05	.....
" 25..	23912	W. S. Craig " ..	" ..	0 05	.....
" 26..	23913	J. Johnston " ..	" ..	0 05	.....
" 26..	23914	A. Walleghion " ..	" ..	0 05	Vendor, Royal Dairy.....
" 26..	23915	W. A. Spiers " ..	" ..	0 05	" Scotch Dairy.....
" 26..	23916	Dickson Bros. " ..	" ..	0 05	" City Dairy.....
" 26..	23917	J. Davidson, Fort Rouge.....	" ..	0 05	" Dairy .....
" 26..	23918	Elm Park Dairy, Winnipeg, Man	" ..	0 05	.....

SESSIONAL PAPER No. 14

Inspection of Whole Milk—*Continued.*

Result of Analysis.					Analyst.	Remarks of the Analyst.
Specific Gravity at 15·5 C.	Water.	Butter Fat.	Other Solids.	Total Solids.		
	p. c.	p. c.	p. c.	p. c.		
1·0340	86·74	4·17	9·09	13·26	..	Genuine.
1·0320	87·12	4·16	8·72	12·88	..	"
1·0320	88·39	3·38	8·23	11·61	..	Under average in solids.
1·0320	88·26	3·48	8·26	11·74	..	
1·0320	87·80	3·70	8·50	12·20	..	Genuine.
1·0330	87·76	3·70	8·54	12·24	..	
1·0305	86·40	4·30	9·20	13·50	Miss S. E. Wright	Genuine.
1·0295	87·55	3·83	8·62	12·45	..	"
1·0285	85·27	5·79	8·94	14·63	..	"
1·0316	87·40	3·43	9·07	12·50	..	"
1·0305	85·18	5·02	9·70	14·72	..	"
1·0285	86·75	3·98	9·17	13·15	..	"
1·0326	87·19	3·81	9·00	12·81	A. Lemoine	"
1·0326	87·87	3·19	8·94	12·13	..	Under average in butter fats.
1·0326	86·42	4·52	9·06	13·58	A. Lemoine	Genuine.
1·0312	87·41	4·45	8·14	12·59	T. Macfarlane	"
1·0333	87·13	4·01	8·86	12·87	"	"
1·0312	87·05	4·23	8·72	12·95	..	"
1·0330	87·10	4·09	8·81	12·90	..	"
1·0323	85·67	5·17	9·16	14·33	..	"
1·0324	85·99	4·84	9·17	14·01	..	"
1·0284	88·26	3·82	7·92	11·74	..	Under average in non-fatty solids.
1·0314	88·20	3·22	8·58	11·80	..	Under average in butter fat.
1·0324	86·65	4·46	8·89	13·35	..	Genuine.
1·0324	87·37	3·70	8·93	12·63	..	"
1·0254	89·88	3·45	6·67	10·12	..	Watered, therefore adulterated.
1·0334	87·45	3·73	8·82	12·55	..	Genuine.
1·0324	84·89	5·98	9·13	15·11	E. B. Kenrick	Genuine.
1·0337	87·76	3·22	9·02	12·24	"	Fat below average.
1·0312	88·07	3·51	8·42	11·93	..	Below average in total solids.
1·0330	88·84	2·48	8·68	11·16	"	Partly skimmed.
1·0333	85·10	5·62	9·28	14·90	"	Genuine.
1·0335	86·47	4·37	9·16	13·53	"	"
1·0230	90·84	2·95	6·21	9·16	..	Watered.
1·0337	89·90	1·42	8·68	10·10	"	Skimmed.
1·0323	87·59	3·68	8·73	12·41	"	Genuine.
1·0331	86·88	4·12	9·00	13·12	"	"
1·0360	90·90	0·50	8·60	9·10	"	Skimmed.
1·0331	87·25	3·82	8·93	12·75	"	Genuine.
1·0296	87·54	4·32	8·14	12·46	"	"
1·0319	86·64	4·58	8·78	13·36	"	"
1·0333	87·30	3·73	8·97	12·70	"	"
1·0325	85·67	5·27	9·06	14·33	"	"
1·0299	88·54	3·38	8·08	11·46	"	Below average in total solids.
1·0290	88·28	3·81	7·91	11·72	"	Watered and below average in non-fatty solids.

TABULATED STATEMENT of the

Date of Collection.	No. of Sample.	Name and Address of Vendor.	Quantity.	Cost.	Name and Address of Furnisher.
1903.		*Calgary District.*			
Dec. 14	21766	W. Maxwell, Ponoka, Alta	1 pint	0 05	
" 16	21767	M. Theroux, Wetaskiwin, Alta	"	0 05	
" 17	21768	C. A. Pomeroy, Edmonton, Alta.	"	0 05	
" 17	21769	C. York "	"	0 05	
" 18	21771	E. Wilson, Strathcona, Alta	"	0 05	
" 21	21772	V. N. DeMille, Calgary	"	0 05	
" 22	21773	E. Hooper "	"	0 05	
" 23	21775	F. M. Freeze "	"	0 05	
" 23	21776	D. W. Woolvains "	"	0 05	
		British Columbia District.			
Nov. 26	23596	James Black, Vancouver	"	0 05	C. Smith, Sea Island, near Vancouver.
" 26	23597	Main Bros., "	"	0 05	
" 26	23598	J. N. Bond "	"	0 05	Vendor
" 26	23600	Intl. Ice & Cold Storage Co., Vancouver.	"	0 05	
" 26	23599	Adam Svencisky, Vancouver	"	0 05	Vendor
" 26	24901	Spa Candy Co. "	"	0 05	McKay, Almond & Co
" 27	24902	P. Young, New Westminster	"	0 05	Vendor
" 27	24903	F. W. Smith "	"	0 05	"
" 27	24904	G. E. Murphy "	"	0 05	"
" 30	24905	W. Clarke, Victoria	"	0 05	"
" 30	24906	C. Macdonald "	"	0 05	"
" 30	24907	T. Alexander "	"	0 05	"
" 30	24908	W. Sinclair "	"	0 05	"
" 30	24909	Hill & Green "	"	0 05	"
" 30	24910	L. McRae "	"	0 05	"
Dec. 2	24914	Charles House, Nanaimo	"	0 05	"
" 2	24915	S. Waddington "	"	0 05	"
" 2	24916	Charles House "	"	0 05	"

SESSIONAL PAPER No. 14

Inspection of Whole Milk—*Concluded.*

Result of Analysis.					Analyst.	Remarks by the Analyst.
Specific Gravity at 15°C.	Water.	Butter Fat.	Other Solids.	Total Solids.		
	p. c.	p. c.	p. c.	p. c.		
1·0337	87·71	3·17	9·12	12·29	Miss S. E. Wright	Under average in butter fat.
1·0306	88·03	3·31	8·66	11·97	"	
1·0317	87·08	4·03	8·89	12·92	"	Genuine.
1·0286	88·45	3·92	7·63	11·55	"	Under average in non-fatty solids.
1·0306	86·71	4·72	8·57	13·29	"	Genuine.
1·0327	87·22	3·82	8·96	12·78	"	"
1·0286	88·32	3·58	8·10	11·68	"	Under average in total solids.
1·0317	88·64	2·97	8·39	11·36	"	Partly skimmed.
1·0266	84·42	8·07	7·51	15·58	"	Under average in non-fatty solids.
1·0300	87·08	4·00	8·92	12·92	Dr. C. J. Fagan	Genuine.
1·0260	89·93	2·17	7·90	10·07	"	Watered.
1·0290	87·90	3·29	8·81	12·10	"	Genuine.
1·0290	88·25	3·42	8·33	11·75	"	"
1·0300	86·14	4·66	9·20	13·86	"	"
1·0280	88·46	3·16	8·38	11·54	"	Under average in total solids.
1·0302	86·98	4·32	8·70	13·02	"	Genuine.
1·0260	88·54	3·75	7·71	11·46	"	Under average in non-fatty solids.
1·0290	87·75	3·90	8·35	12·25	"	Genuine.
1·0290	88·27	3·44	8·19	11·63	"	"
1·0340	87·05	3·54	9·41	12·95	"	"
1·0280	89·74	2·88	7·38	10·26	"	Watered.
1·0280	88·75	3·43	7·82	11·25	"	Under average in total solids.
1·0330	86·64	4·20	9·16	13·36	"	Genuine.
1·0310	86·56	4·57	8·83	13·44	"	"
1·0340	86·08	4·42	9·50	13·92	"	"
1·0320	87·26	3·80	8·94	12·74	"	"
1·0340	86·61	4·70	9·69	14·39	"	"

APPENDIX H.

BULLETIN No. 94—CIDER.

OTTAWA, February 6, 1904.

W. J. GERALD, Esq.,
Deputy Minister of Inland Revenue.

SIR,—In accordance with your instructions of August 4, 1903, a collection was made in November and December last of 41 samples of commercial cider, the whole of which were examined in this laboratory by Mr. J. G. A. Valin, the results of whose work are given in the accompanying tabulated statement.

The specific gravity of these samples, taken at 15·5° C, varies from 1·0025 with 9·54 per cent of alcohol by volume to 1·0688 with only 1·13 per cent. Seventeen out of the forty-one samples contain less than 1 per cent of alcohol by volume, and may be regarded as non-alcoholic. The specific gravities of these vary from 1·0368 to 1·0627, the latter figure being probably higher than the density of pure apple juice. In 1896, I had occasion to determine the gravity of five samples of what was said to be fresh apple juice, made at Lambeth near London, Ont., for the production of cider vinegar. They ranged from 1·0464 to 1·0485 at 18° C. Two samples of apple juice 'fresh from the press,' intended for the manufacture of cider, were supplied to this laboratory in October, 1903, and after filtration found to have specific gravities respectively of 1·0546 and 1·0573 at 15.5 C. Having in view these variations it would seem necessary to obtain, at the place of production, undoubtedly genuine samples of fresh and pure apple juice before drawing any conclusions regarding the samples described in the tables as to their containing added water or sugar.

It will be observed that fourteen of these ciders have been found to contain small qnantities of salicylic acid, the addition of which to alcoholic fermented or other portable liquors renders them, according to the Adulteration Act, liable to be considered as adulterated in a manner injurious to the health.

I have the honour to be, sir,
Your obedient servant,

THOMAS MACFARLANE,
Chief Analyst.

SAMPLES OF CIDER

RESULTS of Examining 41

Date of Collection.	Nature of Sample.	Number of Sample.	Name and Address of Vendor.	Cost. Quantity.	Cost. $ cts.	Name and Address of Manufacturer or Furnisher.
Nov. 26	New Cider..	20409	H. W. Shenton, Springhill, N.S.	3 pints....	0 15	Allen, Norwich, Ont.....
" 26	" ..	20410	McLeod Bros., Amherst, N.S.	" ...	0 10	Unknown, purchased through R. Eaton, Kentville.
" 27	" ..	20415	S. M. Bentley, Truro, N.S..	" ...	0 12	D. Burgess, Sheffield Mills ..
" 30	" ..	20416	J. E. Walker, Dartmouth, N.S.	" ...	0 15	Unknown, purchased through Mumford Bros,, Halifax.
" 30	" ..	20419	Rooney & Lovett, Halifax, N.S.	"	0 15	F. Lunn, Falmouth, N.S....
Dec. 4	" ..	4385	Jas. Ching, Summerside, P.E.I.	"	0 25	Dearborn & Co., St. John, N B
" 5	" ..	4388	Jas. Duffey, Charlottetown..	"	0 20	S. Allen, Norwich, Ont.....
" 5	" ..	4389	F. While, Charlottetown ...	"	0 25	" " ....
Nov. 25	" ..	17988	J. H. Walker, 149 King St. East, St. John.	"	0 15	" " ....
" 25	" ..	17989	Harry G. McBeath, 239 Charlotte St., St. John, N.B.	" ...	0 15	E. Purdy, Deep Brook, Annapolis, N.S.
Dec. 11	" .	17999	Beaton & Co., City Market, Moncton.	"	0 15	A. L. Goodwin, St. John, N.B.
" 12	" .	18000	J. D. Leblanc, Main St., Moncton.	" ...	0 20	" " ....
Nov. 30	Apple Cider	24525	A. Papineau, St. Césaire, Que.	2 bottles..	0 25	Vendor .....
Dec. 4	" ..	24527	Pagnuelo Frères, St. Hyacinthe.	" ..	0 20	F. X. St. Charles, Montreal.
" 7	" ..	24528	E. Ducharme, Mt. St. Hilaire	" ..	free	Himself ....
" 10	" .	24529	Joseph Vachon, Valleyfield..	" .	0 25	J. P. Delisle, Valleyfield....
Nov. 27	" ..	21478	J. Bambrick, 50 George St., Ottawa.	3 pints....	0 20	Allen, Norwich.....
" 27	" ..	21479	Wall & Co., Market Square, Ottawa.	1 quart...	0 15	About 3 weeks in stock.....
Dec. 12	" ..	24531	J. P. Delisle, Valleyfield....	2 bottles..	0 20	T. Kinsella, Montreal. .....
" 16	" ..	23488	O. Gratton, 2094 St. Catherine St., Montreal.	1 quart...	0 10	Not known..... .....
" 16	" ..	23489	L. P. Forrest, 1978 St. Catherine St., Montreal.	" ...	0 10	....
" 16	" ..	23490	Gravel Frères, St. Catherine St.	" ..	0 15	S. Allen, Norwich, Ont.....
" 16	" ..	23491	P. Elliott, City Councillor St., Montreal.	" ...	0 12	.. ..
" 3	" ..	23281	Kelly Bros., Queen St. E., Toronto.	" ..	0 10	Stratford Bros., Brantford...
" 3	" ..	23282	W. Nettleton, 125 Church St., Toronto.	" ...	0 10	S. Allen, Norwich, Ont.....
" 3	" .	23283	Medland Bros.. King St. E., Toronto.	" ...	0 15	Not given ....
" 4	" ..	23284	Andrew G. Bain, King St. E., Hamilton.	" ...	0 12	" . .. .
" 4	" ..	23285	Hazel & Son, King St. W., Hamilton.	" ...	0 14	" ....
" 1	Sweet Cider	22174	Robt. Gardiner, 760 William St., London.	" ..	0 10	M. Routledge, London . .
" 3	" ..	22182	Sol. Allen, Norwich	" ...	0 10	S. Allen, Norwich..... ...
" 4	" ..	22183	J. Ford & Co., Brantford....	" ..	0 05	Stratford Bros., Brantford...
Nov. 23	" ..	23919	E. T. Drewry, Winnipeg....	3 quarts..	0 40	....
" 23	" ..	23920	The Blackwoods Co., Ltd., Winnipeg.	3 pints ...	0 25	S. Allen, Norwich, Ont.....
" 24	" ..	23921	McNab & Roberts, Winnipeg	3 quarts..	0 25	" " .....
" 24	" .	23922	Hudson Bay Co., Winnipeg..	" ...	0 45	....
Dec. 17	" ..	21770	Hallier Aldridge, Edmonton, Alta.	3 pints....	0 20	S. Allen, Norwich, Ont.....
" 17	" ..	21774	S. Laurendeau, Calgary, Alta	" ...	0 25	" " ....
" 1	" .	24912	W. J. Savory, Victoria.....	" ...	0 40	Self ....
" 1	" ..	24913	M. Faletto, Nanaimo.....	" ...	0 40	Rimmings, Nanaimo.....
" 1	" ..	24917	H. A. Edgelt, Vancouver....	1 pint	0 25	W. Bowman, Sumas, B.C...
... ...	... ...	..	Kavanagh Bros., Ottawa ...	.. ..	.....	S. Allen, Norwich, Ont.....

Samples of Cider.

				Results of Analysis.					
					Sugars by Fehling.				
Sp. Gr. of Sample.	Sp. Gr. of Distillate.	Alcohol by Volume.	Sp. Gr. of Residue.	Total Solids by Balling's Table.	Reducing Sugar as stated as invert.	Reducing Sugar after inversion.	Cane Sugar.	Acidity stated as Malic Acid.	Presence of Salicylic Acid.
		p. c.			p. c.	p. c.	p. c.	p. c.	
1·0265	0·9930	5·00	1·0332	8·244	6·39	6·39	None.	0·72	None.
1·0324	0·9969	2·20	1·0350	8·681	4·72	4·72	None.	0·87	
1·0228	0·9048	3·69	1·0272	6·780	3·18	4·08	0·86	0·87	
1·0106	0·9926	5·32	1·0203	5·075	0·99	2·33	1·27	0·87	
1·0042	0·9910	5·86	1·0208	2·700	0·68	0·88	0·19	0·58	
1·0301	0·9979	1·42	1·0322	8·000	4·35	6·70	2·23	0·56	Present.
1·0407	0·9955	3·21	1·0446	11·000	8·65	9·72	1·02	0·53	None.
1·0366	0·9947	3·76	1·0410	10·142	8·16	8·40	.....	0·63	
1·0548	0·9996	0·26	1·0552	13·523	8·00	10·33	2·13	0·58	Present.
1·0451	0·9992	0·53	1·0453	11·166	—	—	—	0·57	None.
1·0546	0·9997	0·20	1·0546	13·381	7·68	9·79	2·00	0·60	Present.
1·0564	0·9998	0·13	1·0566	13·857	7·87	12·78	4·69	0·60	
1·0351	0·9953	3·25	1·0398	8·706	6·22	7·96	1·18	0·62	None fermented.
1·0110	0·9893	7·92	1·0225	5·625	2·35	2·72	0·35	0·88	None.
1·0040	0·9916	6·10	1·0124	3·160	0·92	0·99	0·07	0·79	
1·0029	0·9883	8·80	1·0133	3·475	1·55	1·55	.....	0·46	
1·0027	0·9924	5·47	1·0097	2·125	0·57	0·59	.....	0·58	
1·0524	0·9989	0·73	1·0544	13·333	5·37	6·09	0·68	0·57	
1·0038	0·9875	9·45	1·0125	3·625	0·78	0·85	0·06	0·58	None.
1.0563	0·9904	0·40	1·0569	13·928	8·80	8·80	.....	0·53	Present.
1·0408	0·9973	1·88	1·0426	10·523	8·05	8·14	0·08	0·60	None.
1·0115	0·9922	5·63	1·0195	4·875	1·68	1·88	0·18	0·58	Traces fermented.
1·0570	0·9992	0·53	1·0582	14·238	9·69	11·82	2·19	0·56	Present.
1·0688	0·9983	1·13	1·0705	17·113	10·94	14·94	3·80	0·72	
1·0588	0·9997	0·20	1·0588	14·381	9·46	13·35	2·75	0·58	
1·0627	0·9997	0·20	1·0637	15·534	6·22	7·93	1·62	0·58	
1·0558	1·000	.....	1·0558	13·666	6·14	11·54	5·13	0·58	
1·0276	0·9954	3·28	1·0319	7·925	5·96	6·54	0·55	1·28	None.
1·0530	0·9997	0·20	1·0530	13·000	9·16	10·29	1·45	0·75	Present.
1·0531	0·9999	0·07	1·0531	13·023	6·02	9·02	2·84	0·46	None.
1·0398	0·9949	3·62	1·0443	10·928	7·71	7·71	.....	0·87	
1·0025	0·9874	9·54	1·0155	3·875	1·77	1·77	None.	0·57	
1·0552	0·9995	0·33	1·0553	13·547	3·43	6·20	2·63	0·57	Present.
1·0570	1·000	None.	1·0572	14·000	8·53	11·82	3·12	0·58	
1·0562	0·9997	0·20	1·0565	13·833	8·31	11·73	3·24	0·58	
1·0333	0·9951	3·49	1·0383	9·488	7·27	7·78	0·48	0·58	None.
1·0555	0·9996	0·26	1·0560	13·714	9·04	10·50	1·39	0·70	Present.
1·0352	0·9922	5·63	1·0427	10·547	5·62	8·39	2·63	0·74	None.
1·0368	0·9989	0·73	1·0384	9·512	4·86	8·79	3·72	0·37	
1·0045	0·9913	6·32	1·0131	3·275	0·63	0·63	.....	0·97	
1·0476	0·9981	1·26	1·0495	12·166	7·05	10·11	2·90	0·76	

APPENDIX I.

BULLETIN No. 95—GROUND SPICES.

W. J. GERALD, Esq., OTTAWA, February 19, 1904.

Deputy Minister of Inland Revenue.

SIR,—I beg to submit herewith a series of tabulated statements showing the results obtained in this laboratory in examining a number of samples of ground spices, collected in accordance with your instructions of August 11 last. They were collected in the months of August and September, 1903, and were obtained of different sorts, in various districts and in the numbers given in the following statement :—

	Black Pepper.	White Pepper.	Red Pepper.	All Spice.	Mixed Spices.	Cassia and Cinnamon.	Cloves.	Ginger.
Nova Scotia	6	4	0	3	3	0	2	2
P. E. Island	6	0	0	2	1	0	1	0
New Brunswick	6	1	0	3	0	3	2	4
Province of Quebec	10	8	0	2	0	2	1	0
Montreal district	8	11	0	0	0	0	2	0
Kingston district	4	10	0	0	0	3	1	0
Toronto district	8	9	0	0	0	0	0	1
London district	8	3	0	2	0	2	2	2
Manitoba district	5	5	3	1	0	1	2	0
Calgary district	4	2	0	0	1	0	0	1
British Columbia	11	1	0	3	0	0	0	0
	76	54	3	16	5	11	13	10

Based on the opinions of the analysts which are stated in the tables, the following recapitulation shows the extent to which adulteration prevailed among the 188 samples just enumerated :—

	Genuine.	Doubtful.	Adulterated.	Total.
Black pepper	33	1	42	76
White pepper	23	1	30	54
Red pepper	0	1	2	3
All spice	13	2	1	16
Mixed spices	3	0	2	5
Cassia or Cinnamon	1	0	10	11
Cloves	9	2	2	13
Ginger	6	0	4	10
	88	7	93	188

From the foregoing it appears that only 46·8 per cent of these samples of ground spices were genuine, the remainder being doubtful or adulterated.

A memorandum by Mr. McGill, explaining the method adopted by him in examining the ground gingers is attached to this report.

I have the honour to be, sir,

Your obedient servant,

THOMAS MACFARLANE,

Chief Analyst.

INSPECTION OF BLACK PEPPER—

Date of Collection	Number of Sample.	Name and Address of Vendor.	Quantity.	Cost.	Name and Address of Manufacturer or Furnisher.	Results	
						Water Soluble.	Soluble in Acid after Water.
				$ cts.		p. c.	p. c.
Sept. 14..	20356	W. C. Anderson, Halifax, N.S.	3 pkgs..	0 30	J. P. Mott, Dartmouth, N.S.	2·78	1·92
" 14..	20357	R. Urquhart & Son, Halifax, N.S.	3 " ..	0 25	Schwartz & Sons, Dartmouth	1·68	3·12
" 15..	20361	J. L. Archibald & Son, Halifax, N.S.	3 " ..	0 25	Brown & Webb, Halifax..	2·36	2·58
" 18 .	20371	H. C. Barnaby & Sons, Bridgewater.	3 " ..	0 21	J. P. Mott & Co., Halifax..	2·06	2·24
" 18..	20373	Freeman Bros., Bridgewater.	3 " ..	0 21	R. B. Seaton, Halifax.....	1·96	2·70
" 23..	20389	E. W. Crease, Halifax.....	3 " ..	0 21	Brown & Webb, Halifax....	2·40	2·52
" 19..	4348	W. A. Poole, Montague, P.E.I.	¾ lb...	0 24	J. P. Mott & Co., Halifax..	2·10	1·44
" 19..	4349	J. A. McDonald, Cardigan. P.E.I.	¾ " ..	0 21	Simpson & Co., Halifax....	2·00	1·38
" 19..	4351	H. F. Feehan, Mount Stewart, P.E.I.	¾ " ..	0 21	Dearborn & Co., St. John, N.B.	1·68	3·00
" 19..	4363	W. C. Strong, Sunnyside, P.E.I.	½ " ..	0 14	Severts, Halifax	1·92	2·80
" 27..	4368	A. L. McDonald, Souris, P.E.I.	¾ " ..	0 25	Could not tell where purchased.	2·28	2·82
" 27..	4369	Stevens Bros., Souris, P.E.I.	½ " ..	0 16	Simpson Bros., Halifax.....	2·88	2 26
" 19..	17926	Baird & Peters, Ward St., St. John, N.B.	¾ " ..	0 24	Berry imported by vendors. Ground and packed in Halifax.	2·02	1·60
" 26..	17945	John O'Neill, Moncton, N.B.	¾ " ..	0 30	F. H. Harris & Co., Moncton, N.B.	2·30	2 22
" 28..	*17950	Geo. Stables, Newcastle, N.B.	¾ " ..	0 25	....	1·18	3·64
" 28..	17946	W. G. Bell, Moncton, N.B..	¾ " ..	0 30	S. H. & A. S. Ewing, Montreal.	1·58	1·70
" 8.	17958	Murchie Bros., Charlotte, N.B.	¾ " ..	0 25	A. J Leed, St. Stephen, N.B	2·12	1·90
" 12..	17973	H. C. Jewett, Fredericton, N.B.	3 pkgs..	0 30	Todhunter, Mitchell & Co., Toronto.	2·30	2·06
Aug. 28..	23607	Ringuet et fils, Rimouski....	1 lb...	0 20	Dearborn & Co., St. John, N.B.	2·28	1·78
" 28..	23608	Joseph Parent, Rimouski....	1 " ..	0 22	Dr. E. Morin, Quebec.....	1·78	2·78
" 29..	23609	M. Bernier, Rivière du Loup.	1 " ..	0 25	N. Rioux, Quebec.....	2·54	2·78
" 31..	23614	J. A. Jarvis, Rivière du Loup.	1 " ..	0 15	Hudon, Hebert et Cie, Montreal.	2·20	2·20
Sept. 1.	23619	A. G. Lambert, Lévis.....	1 " ..	0 24	Herron, Montreal.....	0·80	3·18
" 3..	23630	Blais & Huard, Thetford....	1 " ..	0 30	Laporte, Martin & Co., Montreal.	0·96	4·78
" 3..	23633	N. P. Tanguay, Weedon . ..	1 " ..	0 25	.....	1·40	4·18
" 5..	23638	Woodman & McKee, Coaticook.	1 " ..	0 30	L. Chaput et fils, Montreal.	1·80	3·26
" 16.	23643	C. H. Hill, Lachute.....	1 " ..	0 30	Forbes Bros., Montreal.....	0·90	8·30

* Samples 17945 and 17950. In the original bulletin the name of Messrs. S. H. and A. S. Ewing of

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Tabulated Statement of Results.

OF ANALYSIS.

Ash.				Microscopical Examination, &c.	Analyst.	Observations.
Insoluble Ash.	Total Ash.	Loss at 95° C. Moisture, &c.	Petroleum Ether Extract.			
p. c.	p. c.	p. c.	p. c.			
0·72	5·42	10 34	5 74	Pepper tissues only, with some chips and dirt.	Miss E. Davidson	Unadulterated.
		10 72	6 56			
2·00	6·80	10 00	7 00	A little charcoal, many hairs and a foreign tissue unidentified.		Doubtful.
		10 48	6 08			
1·06	6·00	10 60	6 80	Pepper tissues only; coarsely ground....		Unadulterated.
		10 72	7 36			
0·58	4·88	10 52	7 52	Pepper tissues only.		Genuine.
		10 48	7 60			
1·88.	6·54	9 56	4 56	Much maize and wheat starch and many stone cells.		Adulterated.
		9 44	4 88			
1·54	6 46	10 12	7 00	Pepper tissues only; coarse and dirty....		Unadulterated.
		10 24	6 84			
0·26	3·80	8 70	7 15	Apparently pure; contains some fibrous tissues.		
		8 60	7 10			
0·18	3·56	8 85	7 55	A little charcoal or roasted shell, otherwise pure.		
		8 70	7 55			
2·54	7·22	8 20	5 05	Much wheat starch, fibrous tissue, mustard husks and white stone cells.		Adulterated.
		8 35	5 00			
1·38	6·10	8 10	5 85	Pepper tissues only.....		Genuine.
		8·30				
1·18	6·28	8 35	7 35			
		8 40	7 35			
0·84	5·98	7 60	7 50			
		7 70	7 70			
0·28	3·90	8 70	8 10			
		8 65	8 10			
0·74	5·26	7 95	9·00	Some buckwheat and wheat starch.		Slightly adulterated.
		7 75	8·70			
8·60	13·42	7 15	0·75	Contains maize and other foreign starch, many stone cells, some charcoal and fibrous tissues, also a substance resembling turmeric.		Adulterated, being composed of dirt and not much pepper.
		7 15	0·85			
0·44	3·72	7 55	7·20	Pepper tissues only.....		Genuine.
		7 95	7·40			
0 20	4·22	7 30	7·15	Some wheat and rice starch present....		Adulterated.
		7 25	7·35			
0·22	4·58	6 40	8·70	Pepper tissues only.....		Genuine.
		6·50	8·75			
0·18	1·24	11 40	2·55	Wheat (and large amount) flour present; musty and caked.		Adulterated.
		11 55	2·65			
5·24	9·80	8·15	5·45	Wheat and rice (or buckwheat) flour present.		
		7 90	5 30			
1·10	6·42	9 50	9·45	Pepper tissues with a few hairs.....		Genuine.
		9 50	9·40			
1·42	5·82	8 10	10·75	Pepper tissues only.....		
		8·05	10·85			
3·84	7·85	8 40	5 40	Contains much wheat starch, turmeric, much fibrous tissue, charcoal, hairs, &c.		Adulterated.
		9 10	5·80			
5 68	11·42	9 15	3·65	Contains but little pepper but much fibrous tissue, hairs, dirt, &c., also rice starch, mustard husk and turmeric.		
		9 20	3 70			
7·16	13·04	10 10	3·20	Fibrous tissue, hairs and dirt present, also some roasted shells or charcoal.		
		10 00	3 15			
3·70	8·76	10·50	8 50	Genuine, but contains an excess of sand.	A. Lemoine.....	
		10 40	8·35			
6·34	15·54	9·05	5·75	Pepper tissue and sweepings.....		
		8 95	5·90			

Montreal was in error, given as that of the manufacturer or furnisher.

INSPECTION OF BLACK PEPPER—

Date of Collection	Number of Sample.	Name and Address of Vendor.	Quantity.	Cost.	Name and Address of Manufacturer or Furnisher.	Results	
						Water Soluble.	Sol. in Acid after water.
				cts.		p. c.	p. c.
Sept. 17..	23648	C. E. Laflamme, St. Jerome.	1 lb ...	0 20	J. Duffy, Montreal.....	1·10	4·06
Aug. 24..	21383	Black & White, 2084 Notre Dame St., Montreal.	1 " ..	0 25	Ground for the vendor by R. Herron & Co.	3·60	3·10
" 25.	21385	J. Normandeau, 2266 Notre Dame St.	....	...	Not given.....	1·68	3·06
" 25..	21387	A. Brisbois, 2358 Notre Dame St.	....		D. C. Brosseau & Co.....	1·24	3·08
" 25..	21391	G. Dubord, 139 Island St., Montreal.	1 b...	0 20	R. Herron & Co., Montreal.	1·28	2·02
Sept. 11..	21393	G. L. E. Guimond, Beauharnois, Que.	1 " ..	0 25	Hudon, Hubert & Co., Montreal.	1·10	5·00
" 11..	21395	Omer Marchand, Beauharnois	1 " ..	0 20	L. Chaput, Fils & Co.....	0·66	1·42
" 16..	21398	A. Allard, Lachine.....	1 " ..	0 25	Laporte, Martin & Co., Montreal.	1·20	4·88
" 16..	21499	H. T. Barre, 2 St. Catherine St., Maisonneuve.	1 " ..	0 40	Not known.....	0·50	2·08
Aug. 26 .	21403	J. M. Moag, Smith's Falls, Ont.	1 " ..	0 25	Pure Gold Co	2·12	1·68
" 27..	21413	C. Whitney, Prescott, Ont...	1 " ..	0 25	Hamilton Coffee and Spice Co.	2·40	1·88
" 27..	21407	Cameron & Soper, Brockville, Ont.	1 " ..	0 25	C. H. Cochrane & Co., Ottawa.	2·22	2·30
" 27..	21411	Jas. McDougall, Brockville..	1 " ..	0 25	Not given	0·94	1·34
Sept. 2..	23222	W. J. Hobson, 29 King E., Hamilton.	1 " ..	0 40	....	2·06	2·78
" 2..	23224	M. Cummings, 302 James St.	1 " ..	0 25	....	3·22	2·50
" 3..	23228	T. J. Medlands, 228 Queen W., Toronto.	1 " ..	0 25	. ...	1·12	1·94
" 3.	23230	Frank Lyons, 622 Queen W., Toronto.	1 " ..	0 30	Toronto Coffee and Spice Co.	1·06	2·06
" 4..	23232	John Irvine, 552 Queen W...	1 " .	0 30	Todhunter & Mitchell .. .	1·48	1·86
" 5..	23237	Hartman & Co., Brantford ..	1 " ..	0 20	Not given	1 72	1·82
" 5..	23239	T. B. Paisley, 182 Queen E., Toronto, Ont.	1 " ..	0 25	Humphrey, Toronto, Ont..	0·86	1·76
Aug. 22..	23256	C. R. Storey, 252 Queen E., Toronto.	1 " .	0 20	Not given	2·92	3·16
" 24 .	22118	B. B. Gunn, Seaforth, Ont ..	1 " ..	0 30	Todhunter & Mitchell, Toronto.	2·80	1·42
" 25 .	22125	John & Jas. H. Kerr, Wingham.	1 " ..	0 30	Gorham & Eckhart, London, Ont.	1·36	2·72
" 26..	22131	John W. McIntyre, Walkerton, Ont.	1 " ..	0 30	Todhunter & Mitchell, Toronto.	2 20	2·08
" 26..	22135	T. H. Ellis & Co., Mount Forest.	1 " ..	0 25	Canada Spice and Grocers Co., London, Ont.	2·56	1·84
" 31..	22138	Setlers Bros., Palmerston, Ont.	1 " ..	0 30	Canada Spice and Grocers Co., London, Ont.	3·38	2·28
Sept. 1..	22140	Beck & Schell, Berlin.....	½ " ..	0 13	Dunn & Co., Hamilton	2·32	1·92
" 1 .	22145	Geo. Hasenflug, Waterloo....	½ " ..	0 13	Grocers Wholesale Co., Hamilton.	1·64	1·76

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Tabulated Statement of Results.

OF ANALYSIS.

Ash.				Microscopical Observations.	Analyst.	Observations.
Acid Insoluble. Sand.	Total.	Loss at 70° C. Moisture, &c.	Petrolic Ether Extract.			
p. c.	p. c.	p. c.	p. c.			
6·50	11·66	10·25	0 85	Contains wheat starch, excess of stone cells and sweepings.	Alph. Lemoine..	Adulterated.
		10·60	0 90			
2·70	9·40	7·00	3 95	Foreign starch, maize, excess of long stone cells and dust.	...	
		7·00	3 80			
3·16	7·90	7·30	3 60	Wheat flour; black unbleachable substance, probably charcoal, and excess of long stone cells.	...	
		6·90	3 50			
3 86	8 18	6·15	3·90	Pepper tissue and sweepings.....	.	.
		6·10	3 80			
8·26	11 56	6·45	3 55	Wheat starch, roasted shells or charcoal and pepper sweepings.	...	..
		6·65	3 35			
7·92	14·02	6·70	3·40	Long stone cells in excess and pepper sweepings.	.	
		6·80	3 60			
2 44	4·52	7 55	0 60	Rice and maize starch and charcoal. Very little pepper tissue.		
		7·40	0 50			
10·12	16·20	6 35	3 70	Contains excess of pepper sweepings.. . .	..	
		6·35	3 75			
2·90	5·48	7·70	0 40	Not much pepper; long stone cells in excess.	A. Lemoine	Grossly adulterated.
		7·70	0 50			
0·30	4·10	8 35	7 35	. . . . .	.	Genuine.
		8·25	7 75			
0·22	4·50	8 80	6 80	. . . . .	.	.
		8·70	6 65			
0·84	5·36	9·15	6 35	. . . . .	.	
		9·05	6 75			
0 94	3 22	8 90	2 20	Long stone cells in excess, probably from cocoanut shells.	..	.. Adulterated.
		9·20	2 20			
0·48	5·32	7 80	6 70	. . . . .	.	.. Genuine.
		7·90	7·10			
0·62	6·34	8 50	6 25	. . . . .	.	..
		8·35	6 00			
0·78	3·84	7·25	2 70	Wheat starch, roasted shells or charcoal..	Alph. Lemoine.	Adulterated.
		7·00	2 65			
1·04	4·16	5·90	3 60	Wheat and rice starch, Cayenne pepper; many stone cells, probably cocoanut shell.	Miss E. Davidson	
		5·95	3 55			
0·68	4·02	6·10	3 90	Cocoanut shell.....	.	..
		6·10	3 90			
0·16	3·70	5·50	4 15	Buckwheat (or rice) starch, a little wheat starch; turmeric; very many stone cells.	—	—
		5·60	4·40			
1·04	3·66	7·92	5 48	Stone cells and other foreign matter	A. McGill.. .	Adulterated.
						*Alcohol extract.
0 52	6·60	7·85	3·85	Wheat starch..		Adulterated.
		7·75	4 45			
0·14	4 36	9·50	7 00	Pepper tissues only.....	Miss E. Davidson	Genuine.
		9·30	7 05			
1·92	6·00	8·95	4 85	Some stems and a little charcoal; otherwise genuine, although dirty.		
		8·90	4 95			
0·34	4·62	5·30	7·90	Pepper tissues only		
		5·50	7 60			
0·50	4·90	8·45	6·75	Some hairs and fibrous tissue, a very little wheat starch.		Adulterated.
		8·50	6 85			
0·62	6 28	7 75	6·45	Hairs and spiral vessels; a little wheat starch.		
		7·80	6 60			
0·68	4 92	8·20	4·25	Much wheat flour; long stone cells (cocoanut?)		
		8·10	4·15			
0·40	3·80	8·25	3·60	Some wheat flour, hairs and much fibrous tissue; many stone cells and foreign tissue unidentified.		
		8·25	3·75			

INSPECTION OF BLACK PEPPER—

Date of Collection.	Number of Sample.	Name and Address of Vendor.	Quantity.	Cost.	Name and Address of Manufacturer or Furnisher.	Results	
				$ cts.		Water Soluble.	Soluble in Acid after Water.
Aug. 19..	22148	John Sloan, Galt.....	½ " ..	0 15	Todhunter & Mitchell, Toronto.	p. c. 2·94	p. c. 1·68
" 20..	17477	A. E. Key, Minnedosa, Man.	½ " ..	0 15	.....	1·76	3·20
" 21..	17483	Galloway Bros., Gladstone, Man.	½ " ..	0 15	.....	3·52	1·90
" 21..	17489	C. J. McClocklin, Carberry..	½ " ..	0 20	.....	1·74	2·04
" 21..	17494	B. Meek, Virden, Man	½ " ..	0 15	.....	2·52	2·22
" 21..	17498	S. J. Staples, Carman, Man..	½ " ..	0 15	.....	1·76	2·08
Sept. 8..	21744	Philips Bros., Red Deer, Alta.	½ lb...	0 15	Not known.....	1·40	4·60
" 11..	21755	Douglass Bros., Strathcona..	3 tins..	0 30	The Dyson Co., Winnipeg..	1·08	2·96
" 11..	21757	Maclaren & Co., Strathcona.	½ lb...	0 20	" " ..	0·94	3·28
" 15..	21760	Chesney & Hicks, Calgary...	3 tins..	0 45	Great Western Spice Mills, Winnipeg.	0·98	6·02
" 25..	23558	Beone & Co., Vancouver.....	3 cans..	0 30	R. Herron & Co., Montreal.	1·32	3·30
" 25 .	23560	Clarke & Rogerson, Vancouver.	3 " ..	0 30	Not known	1·12	4·32
" 25..	23563	Labelle & Co., Vancouver...	3 " ..	0 30	Stember & Earle, Victoria..	1·94	1·62
" 2..	23572	James Young, Nanaimo.....3	bots..	0 40	J. A. Folger & Co., San Francisco.	2·06	1·58
" 2..	23575	James Hurst, Nanaimo.. ...	3 cans..	0 40	Oriental Mills, Vancouver..	1·22	1·12
" 2..	23576	A. R. Johnston & Co., Nanaimo.	3 " ..	0 30	H. G. Dunn & Co., Hamilton, Ont.	1·88	2·58
" 2..	23577	" " ..	3 " .	0 30	A. Schilling & Co., San Francisco.	2·44	1·60
" 2..	23578	Geo. Bevilockway, Nanaimo.	3 " ..	0 40	F. F. Dalley & Co., Hamilton, Ont.	1·46	1·78
" 4..	23586	W. E. Morrison, Ladysmith.	3 " ..	0 30	Kelly, Douglas & Co., Vancouver.	0·98	0·88
" 4..	23589	A. J. Sinclair.....	3 " ..	0 30	W. H. Walker & Co., Vancouver.	1·00	1·08
" 6..	23590	T. S. Annandale, New Westminster.	3 pkgs..	0 30	Hamilton Coffee and Spice Co., Hamilton.	2·94	1·84

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Tabulated Statement of Results—*Continued.*

OF ANALYSIS.							
Ash.							
Insoluble in Dilute Acid—Sand.	Total.	Loss at 95° C. Moisture, &c.	Petroleic Ether Extract.	Microscopical Examination, &c.	Analyst.	Observations.
p. c.	p. c.	p. c.	p. c.			
0·28	4·90	8 20	7 50		A. Lemoine	Genuine.
		8 05	7 70			
3·22	8 18	10 50	5 05	Wheat starch and charcoal or roasted cells		Adulterated.
		10 60	5 35			
0·34	5·76	10·10	5 35			Genuine.
		9 90	5 70			
0·80	4·58	9 75	7 25			
		9 65	7 35			
0·36	5·10	11·10	8 50			
		11 25	8 30			
0·72	4 56	12 65	6 35			
		12·35	6 00			
6·80	12·80	9 27	5 85	Pepper tissue, sweepings and sand	A. Lemoine.	Adulterated.
		8 90	4 20			
4·56	8 60	7 65	3 85	Some wheat starch, pepper tissues, sweep-		
		7 40	3 75	ings and sand.		
5·06	9·22	10 05	3 95	Wheat starch, long stone cells and sand.		
		10 00	3 75			
5·08	12·08	6 20	2 70	Wheat flour, charcoal or roasted shells, and		" (sold
		6·20	2·70	excess of sand.		as compound).
3·70	8·32	10 15	4 20	Wheat flour, pepper tissue, a little char-		Adulterated.
		10 20	4 40	coal or roasted shells.		
5·06	10·50	8 30	1 75	Wheat starch, long stone cells, and roasted		
		8·35	1 70	shells or charcoal.		
0·22	3·78	7·75	5 75	Wheat flour		
		7 40	5 95			
0·34	3·98	10 30	7 10	Pepper tissue only		Genuine.
		10 30	7 45			
0 78	3·12	8 35	4 15			
		8 40	4 00			
2·76	7·22	8 15	6 30	Wheat flour		Adulterated.
		8 00	6 55			
0·20	4·24	7 65	7 05	Pepper tissue only		Genuine.
		8·00	6 80			
0·20	3·44	8 00	3 50	Wheat flour, and charcoal or roasted shells	A. Lemoine	Adulterated.
		7 75	3 50			
0·90	2·76	8 60	4 60	Pepper tissue only	Miss E. Davidson	Genuine.
		8 40	4 60			
·68	2 76	9·85	4 40			
		9·65	4 60			
0·18	4·96	6·35	6 15			
		6·35	6 25			

INSPECTION OF WHITE PEPPER—

Date of Collection	Number of Sample.	Name and Address or Vendor.	Quantity.	Cost.	Name and Address of Manufacturer or Furnisher.	Alcohol Extraction
				$ cts.		p. c.
Sept. 14..	20355	W. C. Anderson, Halifax, N.S....	3 pkgs.	0 15	J. P. Mott & Co., Dartmouth	....
" 15..	20358	R. Urquhart & Co., Halifax.....	3 " ..	0 30	Schwartz & Sons, Dartmouth	....
" 18..	20372	H. C. Barnaby & Sons, Bridgewater, N.S.	3 " ..	0 30	Todhunter & Mitchell, Toronto.	.....
.... ..	*20379	W. B. Calhoun & Co., Middleton, N.S.	3 for..	0 30	T. B. Barker and Sons, St. John, N.B.	..
Aug. 20..	17931	Dearborn & Co., St. John, N.B...	3 pkgs.	0 25	Dearborn & Co., St. John, N.B.	....
" 29..	23610	M. Bernier, Rivière du Loup	1 lb ...	0 35	N. Rioux. Quebec.	6·65
" 31..	23613	Damiens et Cie., Rivière du Loup.	1 " ...	0 50	Jos. Viel, Riviere du Loup..	1·92
Sept. 1..	23622	E. Thivierge, Lévis, Que..... ...	1 " ...	0 40	E. Couture, Lévis, Que.. ..	3·32
" 2..	23624	S. P. Brosseau, Quebec	¾ " ...	0 22	. ...	1·50
" 3..	23631	A. S. Johnson, Thetford.....	1 " ...	0 30	Whitehead Burrier, Quebec..	3·36
" 5..	23634	Coaticook Chem. Co., Coaticook...	1 " ...	0 25	J. A. Matheson & Co., Montreal.	6·80
" 5..	23637	Woodman & McKee, Coaticook...	1 " ...	0 40	Pure Gold Mfg. Co., Toronto	6·35
" 15..	23639	Dme. L. Gagnon, Ste. Rose.....	1 " ...	0 40	Laporte, Martin & Cie., Montreal.	5·32
" 22..	21382	J. H. Caille, 702 St. Catherine St., Montreal.	1 " ...	0 35	Marrotte & Leblanc.....	
Aug. 24..	21384	Black & White, 2084 Notre Dame St., Montreal.	1 lb...	0 35	Ground for the vendors by R. Herron & Co.	7·22
" 24..	21365	J. Normandeau, 2266 Notre Dame St. Montreal.	1 " ...	0 35	Not given	4·84
" 24..	21386	A. Brisbois, 2358 Notre Dame St..	1 " ...	0 30	D. C. Broneau & Co.	2·97
" 24..	21388	Martin & Rabeau, 168 Centre St...	1 " ...	0 35	Marrotte & Leblanc	4·22
" 24..	21390	G. Dubord, 189 Island St.	1 " ...	0 30	"	4·99
Sept. 11 .	21392	G. L. Guimond, Beauharnois, Que.	1 " ...	0 35	Hudson, Herbert & Co.....	6·10
" 11..	21396	J. G. Leonard " ..	1 " ...	0 35	F. F. Dally & Co	5·44
" 15..	21397	A. Allard, Lachine..... .	1 " ...	0 35	Laporte, Martin & Co., Montreal.	4·39
" 16..	21399	W. Bosisquet, 554 Notre Dame St., Maisonneuve.	1 " ...	0 40	Not known.....	3·90
" 16..	21498	H. F. Barre, 2 St. Catherine St.. Maisonneuve.	1 " . .	0 40	"	.....
" 26..	21402	J. M. Moag, Smith's Falls..... ..	1 " ...	0 40	Pure Gold Co.....	7·77
" 26..	21404	Cook & Halfpenny, Smith's Falls..	.....	.....	Not given	7·45
" 27..	21406	Cameron & Soper, Brockville	.... .	... .	"	7·07
" 27..	21408	R. N. Dowsley "	1 lb...	0 40	"	4·85
" 27..	21410	Jas. McDougall "	1 " ...	0 30	"	2·93
" 27..	21412	C. Whitney, Prescott.....	1 " ...	0 35	J. W. Chamberlin & Co., Prescott.	3·46
Aug. 28..	21415	R. Nichols, Cornwall, Ont.....	1 " ...	0 40	Not known.....	6·57
" 28..	21416	" "	1 " ...	0 30	"	6·80
Sept. 1..	21433	W. G. Rogers, Gananoque, Ont...	1 " ...	0 35	Pure Gold Co..... .	5·61
" 1..	21434	J. S. Watt " ..	1 " ...	0 40	S. H. & A. S. Ewing.. ...	4·94
" 2..	23221	W. J. Hobson, 29 King East, Hamilton.	1 " ..	0 40	. . ..	5·84
" 2..	23223	M. Cummings, 302 James, Hamilton.	1 " ...	0 40	F. F. Daly Co....	4·95

NOTE.—Sample white pepper 21390 was sold as pepper, paid for as such and divided, after which given at time of sale that article was other than pepper.

* Sample 20379. In the original bulletin the name of the Maritime Spice and Coffee Co., was, in

Tabulated Statement of Results.

Results of Analysis.						Microscopical Examination.	Analyst.	Observations.
Ash.								
Soluble in Water.	Insoluble in Acid after Water.	Acid Insoluble Sand.	Total.	Loss at 95° C. Moisture, &c.	Petrolic Ether Extract.			
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.			
0·36	0·66	0·06	1·08	10·32	5·20	Pepper tissues only.....	Miss E. Davidson.	Unadulterated.
				10·68	4·68			
0·60	2·10	0·26	2·96	12·40	4·62	A little charcoal	"	"
				12·16	4·52			
0·30	1·56	0·42	2·28	11·04	5·20	Pepper tissues only; some husk.	"	"
				10·80	5·00			
0·58	2·02	0·28	2·88	10·52	4·00	Maize starch and a little wheat; many stone cells.	"	"
				10·36	4·20			
0·66	2·22	0·24	3·12	9·45	7·30	Pepper tissues only..	"	Genuine.
				9·45	7·10			
0·12	0·94	..	1·06	13·95	...	Pepper..	A. McGill	"
0·26	1·50	..	1·76	10·83	..	Wheat flour and other foreign matter.	"	Adulterated.
0·46	4·06	..	4·52	12·12	..	Foreign tissues.....	"	"
0·62	2·88	..	3·50	24·28	....	Corn starch & much foreign tissue-fermenting matter.	"	"
0·24	3·90	..	4·14	11·23	...	Rice starch and other foreign matter.	"	"
1·16	1·90	....	3·06	12·24	.. ...	Pepper..	"	Genuine.
0·68	9·74	.. ..	0·82	13·31	.	"	"	"
0·36	2·20	..	2·56	12·88	.. .	Wheat starch, &c.....	"	Adulterated.
0·82	1·04	0·24	2·10	10·45	4·30	Rice flour and a little wheat starch.	A. Lemoine..	"
				10·35	4·15			
0·58	1·60	.....	2·38	8·83	.. ..	Pepper tissues..... ...	A. McGill	Genuine.
0·50	1·50	.	2·00	8·33	..	Rice starch, &c.....	"	Adulterated.
0·34	3·14	....	3·48	8·43	....	"	"	"
0·76	1·16	.....	1·92	9·35	....	Wheat and rice starches, &c.	"	"
0·72	1·20	.....	1·92	9·63	.. ..	Maize starch, &c... . .	"	"
0·62	5·16	... .	5·78	8·68	.....	Pepper tissues	"	Genuine.
0·40	2·08	....	2·48	9·58	.....	Wheat starch, &c	"	Adulterated.
1·04	7·92	.. .	8·96	7·60	.	Many starch cells.....	"	"
0·70	1·22	. .	1·92	9·35	.....	Maize starch, &c.....	"	"
0·44	1·86	1·06	3·36	8·65	2·05	Wheat starch present	A. Lemoine	"
				8·45	1·95			
0·20	1·24	.....	1·44	9·14	....	Pepper tissue.....	A. McGill	Genuine.
0·12	0·88	....	1·00	9·16	.....	"	"	"
0·16	0·94	. ..	1·10	9·05	. .	"	"	"
0·52	1·74	.....	2·26	9·17	....	Wheat flour, &c.....	"	Adulterated.
0·32	1·96	.....	2·28	9·62	.. ...	"	"	"
0·34	1·98	.....	2·32	9·31	.....	"	"	"
0·56	2·76	.....	3·32	9·45	.....	Pepper tissues	"	Genuine.
1·10	6·18	.....	7·28	8·39	.....	"	"	"
0·56	4·20	.....	4·76	9·10	.....	"	"	"
0·44	2·38	... ..	2·82	9·88	....	"	"	"
1·16	1·32	.....	2·48	9·98	.....	"	"	"
0·40	2·04	.....	2·44	10·19	..	Wheat starch, &c.....	"	Adulterated.

vendors said it was a compound. The package was not marked 'Compound,' and no indication was error, given as that of the manufacturer or furnisher.

INSPECTION OF WHITE PEPPER—

Date of Collection	Number of Sample.	Name and Address of Vendor.	Quantity.	Cost.	Name and Address of Manufacturer or Furnisher.	Alcoholic Extraction.
				$ cts.		p. c.
Sept. 2..	23225	J. L. Brown, 47 McNab St	1 lb. ..	0 35	F. F. Daly Co...	7·36
3..	23227	T. J. Medland, 228 Queen, Toronto	1 " ...	0 40	Not given	2·57
3..	23229	Frank Lyons, 622 Queen St. West, Toronto.	1 " ...	0 30	Toronto Coffee and Spice Co.	
" 3..	23231	John Irvine, 552 Queen St. West, Toronto.	1 " ...	0 40	Todhunter & Mitchell.....	5·51
" 4..	23236	Hartmann & Co., Colborne St., Toronto.	1 " ...	0 40	Not given	. .
" 5..	23238	T. B. Paisley, 182 Queen St. East, Toronto.	1 " ...	0 25	Humphrey, Toronto.....	3·57
" 5..	23240	C. R. Story, 252 Queen St. East, Toronto.	1 " ...	0 30	Not given.	
Aug. 20..	22109	W. F. O'Neill, Clinton, Ont	¾ " ...	0 30	Todhunter & Mitchell, Toronto.	6·85
Ang. 24..	22122	H. M. Tudhope, Wingham	1 " ...	0 40	Hamilton Coffee and Spice Co., Hamilton.	6·13
" 25 ..	22126	John Waddell, Harrison, Ont.....	1 " ...	0 40	Gorman & Eckart, London, Ont.	4·84
" 19..	17478	Wright & Co., Minnedosa, Man.	½ " ...	0 25	.. ..	6·60
" 20..	17481	S. Schooley, Gladstone, Man.....	½ " ...	0 20	.. ..	8·36
" 21..	17484	J. O'Rielly, Portage-Laprairie	½ " ...	0 25	....	6·11
" 25..	17495	W. J. Wilcox & Co., Virden, Man.	½ " ...	0 20	....	
" 26..	17500	G. D. Raymond, Carmen, Man ...	¾ " ...	0 30	The Dyson Co., Winnipeg	
Sept. 10..	21754	Revillion Bros., Edmonton..	3 tins..	0 30	W. G. Dunn & Co., Hamilton.	.. ..
" 15..	21761	W. Pitman & Co., Calgary, Alta..	½ lb...	0 20	Codville & Co., Winnipeg.	
" 4..	23587	Simon Léiser & Co., Ladysmith, B.C.	3 cans .	0 40	Simon Léiser & Co., Victoria, B.C.	...

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Tabulated Statement of Results—*Concluded.*

Results of Analysis.									
Ash.									
Soluble in Water.	Soluble in Acid and Water.	Acid insoluble Sand.	Total.	Loss at 100° C. Moisture.	Petrolic Ether Extract.	Microscopic Observations.	Analyst.	Observations.
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.			
0·30	1·20	.....	1·50	10 08	...	Pepper tissue	A. McGill....	Genuine.
0·30	1·78	.....	2·08	9·39	...	Wheat flour, &c., other foreign tissues.	"	Adulterated.
0·28	1·80	0·24	2·32	11 95	4 45	Wheat starch present, and long stone cells, probably of cocoanut.	A. Lemoine..	
				11·60	4 25			
0·20	1·90	.....	2·10	9·86	....	Wheat flour.....	A. McGill....	
1 00	1 40	0·20	2·60	8 50	6 50	A little wheat starch	A. Lemoine...	Slightly adulterated.
				8·70	6·10			
0 62	1 08	.....	1·70	9 53	....	Wheat flour and other starches.	A. McGill....	Adulterated.
0 22	1 84	0·20	2·26	9 10	3·90	Wheat starch.....	A. Lemoine...	
				9 10	3·75			
0 18	1·46	....	11·91	.....	....	Pepper tissues	A. McGill....	Genuine.
0·38	2 74	....	3 12	13 11	....	Pepper tissues	A. McGill....	Genuine.
0 40	1·84	..	2 24	12 16	..	Wheat flour	"	Adulterated.
0 16	0 86	.....	1·02	14 90	...	Pepper tissue	"	Genuine.
1·04	2·46	....	3 50	12 22	..	Wheat flour and buckwheat	"	Adulterated.
0 32	1·60	....	1·92	14 90	..	Pepper tissue	" ...	Genuine.
				70° C.				
0·28	1·22	0·14	1·64	10 80	4 55	Wheat starch and a little charcoal.	Miss E. Davidson.	Adulterated.
				10·50	4·75			
0·52	1·96	1 14	3 62	6 40	4·15	Many whitestone cells present (apparently foreign).	"	
				6·50	3·95			
1 32	2·08	0·66	4 06	8 15	5 35	Some wheat starch and tumeric.	"	
				7 85	5 50			
0 76	2 00	1·18	3·94	10 30	6 55	Pepper tissues only	"	Genuine.
				10 35	6 55			
1 56	0·90	0·14	2.60	10 00	6·00	Contains much potato starch.	"	Adulterated.
				9·95	5 95			

INSPECTION OF RED PEPPER—

Date of Collection	Number of Sample.	Name and Address of Vendor.	Quantity.	Cost.	Name and Address of Manufacturer or Furnisher.
				$ cts.	
Aug. 20..	17479	A. E. Remlin, Neepawa, Man.	½ lb...	0 20	
" 21..	17485	Hudson Bay Co., Portage Laprairie.	½ " ...	0 20	
" 26..	17499	W. T. Roblin & Co., Carman, Man.	½ " ...	0 20	

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Tabulated Statement of Results.

Result of Analysis.								Analyst.	Observations.
Ash.									
Water soluble.	Soluble in Acid after Water.	Total.	Moisture.	Alcohol Extract.	Dry residue in soluble in Alcohol.	Sum—Direct Estimation.			
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.			
11·28	1·22	12·50	8·86	21·60	69·50	99·96		A. McGill. .	Has a bright red colour; does not dye wool in acid bath; microscope shows wheat starch and some foreign tissues. The high soluble ash and alcoholic extraction are remarkable. Adulterated with starch and other materials.
4·70	3·54	8·24	9·22	7·52	83·62	100·36			Reddish salmon colour; does not dye wool in acid bath; microscope shows no starch, but some apparently foreign tissue. Not identified.
2·36	3·02	5·38	8·92	13·92	77·90	100·74			. . Reddish salmon colour; dyes wool in acid bath; microscope shows much wheat starch and foreign tissues. Adulterated with flour and coloured with a coal tar dye.

INSPECTION OF ALLSPICE—Tabulated Statement of Results.

Date of Collection	No. of Sample.	Name and Address of Vendor.	Quantity.	Cost.	Name and Address of Manufacturer or Furnisher.	Miscroscopic Examination.	Observations.	Analyst.
1903.				8 cts.				
Sept. 14	20352	A. L. Doyle & Co., Halifax, N.S.	3 pkgs.	0 15	W. H. Schwartz & Sons, Halifax, N.S.	Pimento tissues	Genuine	A. McGill.
" 15	20363	J. L. Archibald & Son "	3 "	0 18	Simson Bros., Halifax	"	"	"
" 15	20390	E. W. Crease, "	3 "	0 21	Brown & Webb "	"	"	"
Aug.	4361	Brace & McKay, Sunnyside.	1 lb.	0 12	Hudon, Herbert & Co., Montreal	"	"	"
" 27	4372	Geo. Rackham, Charlottetown	1 "	0 14	Carroll Bros., Charlottetown	"	"	"
" 20	17930	Frank E. Williams, 80 Charlotte St., St. John.	1 "	0 36	Dalton Bros., Toronto, Ont	Essentially pimento; a little maize starch.	Doubtful	"
" 29	17954	Adams, Burns & Co., Water St., Bathurst.	1 "	0 30	John P. Mott, Halifax, N.S.	Pimento tissues	Genuine	"
Sept. 8	17959	Henry E. Hill, King St., Charlotte, N.B.	1 "	0 30	Unknown	"	"	"
Aug. 31	23616	Romeo Lesperance, Montmagny, Q.	1 "	0 40	Maxwell & Co., Toronto	Unusually large number of stone cells.	Doubtful	"
"	23625	M. W. Coleman, Quebec	1 "	0 38	S. H. & A. S. Ewing, Montreal	Pimento tissues	Genuine	"
" 22	22119	Andrew Young, Seaforth			Todhunter & Mitchell, Toronto	"	"	"
" 26	22136	J. S. Ireland, Mount Forest			" " "	"	"	"
" 20	17480	John Small, Neepawa	3 cans	0 30		"	"	"
" 25	23562	J. Charters, Vancouver	3 "	0 30	B. C. Coffee & Spice Co., Vancouver.	Wheat and barley starches	Adulterated	"
"	23573	James Young, Nanaimo	3 bottles	0 40	J. A. Folger & Co., San Francisco.	Pimento tissues	Genuine	"
"	23574	H. A. Millar "	3 "	0 35	Simon Leisser, Victoria, B.C.	"	"	"

INSPECTION OF MIXED SPICES.—Tabulated Statement of Results.

Date of Collection	No. of Sample.	Name and Address of Furnisher	Quantity.	Cost.	Name and Address of Manufacturer or Furnisher.	Analyst.	Observations.
1903.				$ cts.			
Sept. 15..	20362	J. L. Archibald & Son, Halifax, N.S.	3 pckgs ..	0 15	J. P. Mott & Co., Halifax ..	A. McGill..	Ground spices; wheat flour present; adulterated.
"	20380	W. B. Calhoun & Co., Middleton, N.S.	3 "	0 30	T. B. Barker & Sons, St. John, N.B.	"	Mixed whole spices; genuine.
" ..	4373	Geo. Rackham, Charlottetown ..	¼ lb.	0 20	Carroll Bros., Charlottetown ..	"	.. Ground spices; genuine.
" 10..	21753	Garipley & Lessard, Edmonton..	3 tins.	0 40	The Great West Spice Mills, Winnipeg.	"	.. Mixed spices, maize and some wheat starch; adulterated.
" 18..	20374	Freeman Bros., Bridgewater, N.S.	3 pkgs...	0 30	J. P. Mott & Co., Dartmouth, N.S.	"	. Mixed whole starch; genuine.

* Pickling spice.

INSPECTION OF CASSIA AND GROUND

Date of Collection	No. of Sample.	Name and Address of Vendor.	Quantity.	Cost.	Name and Address of Manufacturer or Furnisher.
				8 cts.	
Aug. 20..	17929	C. S. Philips, cor. Douglas Avenue and Main St., St. John, N.B.	¾ lb. . .	0 25	Todhunter, Mitchell Co., Toronto.
" 31..	23615	A. Blais, Montmagny, Que.....	1 "	0 40	Standard Spice Mills, Three Rivers.
Sept. 1..	23620	Chas. Castonguay, Lévis	1 " ...	0 40	Whitehead & Turner, Quebec..
Aug. 26..	21405	Cook & Halfpenny, Smith's Falls, Ont.	1 " ..	0 35	Not given .....
" 27..	21409	R. N. Dowsley, Brockville, Ont....	1 "	0 40	" .....
Sept. 1..	21432	T. A. Rogers, Gananoque	1 "	0 40	" .....
Aug. 25..	22132	Whitehead Huether, Walkerton...	1 " . . .	0 40	Pure Gold Spice Manufacturers, Toronto.
Sept. 1...	23141	Stuebing & Co., Berlin.....	½ "	0 20	Gorman Eckhart, London, Ont.
Aug. 24..	17491	J. Bower & Co., Brandon.....	½ "	0 20	.....
" 29..	17953	A. N. DesBrisay, Bathurst, N.S...	¾ "	0 25	Todhunter, Mitchell & Co., Toronto.
Sept. 9..	17963	Jas. F. McCluskey, Grand Falls, N.B.	3 pkgs....	0 30	Maritime, Spice and Coffee Co., St. John, N.B.

NOTE.—Since Cassia and Cinnamon are the barks of allied species of Cinnamomi, they necessarily valueless portions of cortex and wood ; and is characterized by a greater preponderance of bast cells, and these species ; and even its indications must be accepted with caution, since some samples of each species

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CINNAMON—Tabulated Statement of Result.

Result of Analysis.				Remarks.	Opinion.	Analyst.
Hygroscopic Moisture.	Ash.					
	Total.	Soluble.	Insoluble.			
p. c.	p. c.	p. c.	p. c.			
...	6·66	0·37	6·29	Cassia tissue	Adulterated ..	A. McGill
....	3·22	0·92	2·30	Chiefly cassia		
.. .	8·92	0·52	8·40	Cassia.....		
....	3·22	0·60	2·62	Cassia tissues and foreign starch....		
. .	4·00	1·68	2·32	Cinnamon and cassia tissues.....		
. .	4·56	0·64	3·92	Chiefly cassia tissues.....		
.	4·08	0·84	3·24	Cinnamon with some cassia		
.... . .	4·90	0·78	4·12	Chiefly cassia.....		
. ..	8·26	1·46	6·80	Cassia tissues.....		
8·42	2·76	0·96	1·80	Ground cassia ; adulterated with wheat flour.		
7·08	6·58	0·98	5·60	Ground cassia ; apparently genuine..		

have many features in common. The latter is distinguished by having been more carefully freed from other structural peculiarities. Hence the miscroscope is the chief and only reliable means of differentiating closely approximate to those of the other.

A. McGILL.

INSPECTION OF GROUND CLOVES—

Date of Collection	Number of Sample.	Name and Address of Vendor.	Name and Address of Manufacturer or Furnisher.
Sept. 15.	20364	J. L. Archibald & Co., Halifax	Brown & Webb, Halifax
" 15.	20378	W. B. Calhoun & Co., Middleton, N.S.	Maritime Spice and Coffee Co., St. John.
Aug. 27.	4367	A. Currie & Co., Souris, P.E.I	N. Rattenburg, Charlottetown.
" 25.	17941	King Asbell & Co., Sussex, N.B	G. S. DeForest & Sons, St. John.
Sept. 8.	17956	E. M. Ganong, Charlotte	A. J. Teed Co., St. Stephen, N.B
" 8.	23626	E. G. Turcot, Quebec.	Turcot Frères & Cie, Quebec.
Aug. 25.	21389	Martin & Rabeau, 168 Centre St., Montreal.	Marrotte & Leblanc
" 25.	21394	Omer Marchand, Beauharnois.	L. Chaput fils & Co.
" 27.	21414	J. H. Bradley, Prescott.	H. P. Eckardt & Co.
Sept. 4.	23235	James & Deming, Colborn St., Brantford	F. F. Dally Co
" 1.	22142	Beutzer & Co., Berlin, Ont	Gorman, Eckart & Co., London
Aug. 21.	17490	W. J. Young, Brandon, Man	
" 27.	23701	G. R. Hanna & Co., Carman	

NOTE.—The adulteration in some of the above samples consists in the addition of foreign matter of cloves. Part of this tissue (e.g. woody fibre) may come from admixture of clove stems, but this cannot be volatile matter, and the very marked lowering of the volatile oil. Of course, these features might come October, 1900.—A. McGILL.

Tabulated Statement of Results.

Result of Analysis.						Remarks.	Analyst.
Ash.							
Total.	Insoluble.	Soluble.	Hygroscopic Moisture.	Volatile Oil.	Total Volatile Matter.		
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.		
5·94	2·82	3·12	3·30	14·50	17·80	Colour light, coarse, genuine	A. McGill.
7·82	4·48	3·34	5·18	9·74	14·92	Colour normal, fine; insoluble ash high and a decided trace was insoluble in acid; some tissues doubtfully genuine; doubtful.	
6·78	3·68	3·10	3·28	14·78	18·06	Light colour, coarsely ground, clove tissues only, genuine.	
7·08	3·84	3·24	4·28	14·48	18·76	Colour light, fine, genuine	
6·14	3·20	2·94	4·18	17·76	21·94	Colour normal, fine, genuine	
6·52	3·28	3·24	7·54	12·22	19·76	Colour dark, coarse, genuine	
7·00	3·76	3·24	4·26	5·52	9·78	Colour dark, fine, taste weak, excess of stone cells, foreign tissue, adulterated.	
6·76	3·48	3·28	5·22	10·46	15·68	Colour light, coarse, genuine	
5·64	2·80	2·84	6·00	15·54	21·54	Colour normal, fine, genuine	
6·50	3·34	3·16	4·68	13·14	17·82		
5·96	3·10	2·86	6·72	15·86	22·58		
6·22	3·20	3·02	9·56	12·70	22·26	Colour normal, coarse, some doubtful structures under microscope, hygroscopic moisture very high, doubtful.	
6·98	3·86	3·12	5·96	5·54	11·50	Colour light, coarse, taste feeble, foreign tissues of light colour, but non-starchy, adulterated.	

non-starchy character, containing stone cells and other vegetable tissues not largely present in genuine certainly determined. The effect of this adulteration is shown in the considerable lowering of the total from addition of exhausted cloves. The methods of analysis adopted are those laid down in Bulletin 73,

INSPECTION OF GINGER—

Date of Collection	Number of Samples.	Name and Address of Vendor.	Quantity.	Cost.	Name and Address of Manufacturer or Furnisher.
				$ c.	
Sept. 15..	20359	W. J. Hopgood, Halifax, N.S.....	3 pkgs..	0 27	Schwartz & Sons, Halifax .. ..
" 15..	20360	J. L. Archibald & Sons, Halifax, N.S.	3 " ..	0 30	Brown & Webb, Halifax .....
Aug. 20..	17928	E. E. McMichael, 40 Dock St.. St. John, N.B.	¾ " ..	0 20	Imported by Vendor and ground here.
" 28..	17949	W. Bannon, Newcastle, N.B.....	¾ lb...	0 30	T. B. Barker & Sons, St. John, N.B.
Sept. 8..	17957	Inches & Grimmer, Charlotte Co....	3 " .	0 30	Todhunter Mitchell, Toronto....
" 9..	17964	A. J. Martin, Grand Falls.	3 " ..	0 30	A. J. Teed Co., St. Stephen, N.B.
Aug. 2..	23226	J. L. Brown, 47 McNab St., Hamilton.	1 " ..	0 35	F. F. Dally Co.....
" 2..	23234	James & Deming, Brantford, Ont....	1 " ..	0 40	" .....
" 24..	22121	Geo. Powell, Blyth, Ont.....	1 " ..	0 30	Unknown ....
Sept. 9..	21748	Fowler & Co.. Wetaskiwin.....	.....	.....	Blue Ribbon Mfg. Co., Winnipeg.

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Tabulated Statement of Results.

Result of Analysis.			Microscopic Character.	Observations.	Name of Analyst.
Hygroscopic Moisture.	Cold water extractive, p.c. on dry substances.	Insoluble matter, p. c. on dry substances.			
p. c.	p. c.	p. c.			
11·62	19·5	80·5	Ginger starch and tissue	Genuine	A. McGill.
11·24	19·7	81·3	"	"	"
10·88	17·5	82·5	"	"	"
11·60	14·3	85·7	"	Contained exhausted ginger or is of lower than average quality.	"
8·12	13·8	86·2	"	"	"
10·74	19·6	80·4	"	Genuine	"
7·20	21·4	78·6	"	"	"
12·30	15·1	84·9	"	Contains exhausted ginger or is of lower than average quality.	"
7·78	15·5	84·5	"	"	"
10·86	14·9	85·1	"	"	"
10·14	18·7	81·3	Ginger starch and tissue with a trace of wheat starch.	Genuine	"
12·40	16·7	83·3	Ginger starch and about 20 p.c. wheat.	Adulterated with foreign starchy matter.	"
12·84	18·9	81·1	Ginger starch, &c., with a trace of foreign starch.	Genuine	"

OTTAWA, December 1, 1903.

Method of working on ground ginger.

The adulteration of ginger usually consists either in the addition of foreign matter (flour, starches, etc.,) or in the use of exhausted rhizomes, *i.e.* ginger from which the valuable principles have been more or less washed out.

The detection of foreign matter is made by means of the microscope; but the residue left after water extraction (as below) is better suited to the uses of the microscopist than in the raw sample.

The detection of exhausted ginger naturally depends upon a knowledge of the extracted matter yielded by the sample and a comparison of this with the normal extractive which genuine ginger yields on similar treatment.

Since the commercial extraction of ginger is made with cold water, this is the proper solvent to use in the laboratory.

Bulletin 48, (May, 1897), p. 13—records the result of four cold water extractions of genuine ginger by Mr. Babington. These gave a maximum of 16·7 and a minimum of 12·3 per cent.; with a mean of 14·7 per cent.—calculated on the dry material. In the extraction of ginger by cold water, much will naturally depend upon the method of carrying out the operation. Unfortunately Mr. Babington has not recorded the method employed by him. I am convinced that the numbers obtained would have been considerably higher, and possibly more constant for genuine ginger, had mechanical agitation been used in treating with the solvent. The advantages of mechanical agitation are sufficiently apparent; the increased effectiveness, and the fact that given conditions can be exactly duplicated, are the most important. I have worked as follows:—

Moisture.—Five grammes of the sample is exposed on a watch glass to a temperature of 90°–100° in the water-oven, until constant weight is obtained. When an ordinary drying oven is used this may require 10 to 12 hours or more. With my oven, using a forced draught, 2 to 3 hours is sufficient.

Cold Water Extractive.—The dry sample is transferred by means of a dry funnel, to the centrifuge tube—of about 150 cc. capacity—and treated with 100 cc. of water. The tubes are stoppered and placed in the mechanical shaker (having horizontal motion) for 30 minutes. They are then whirled for 10 minutes, when the insoluble matter becomes compacted tightly in the bottom of the tube and the clear supernatant liquid filters readily. The filtration is made by a weighed filter paper, whose dry weight is known. The undissolved residue is treated a second time with 100 cc. of cold water in the shaker, again whirled, and the clear liquid poured through the filter. Finally, the residue is washed on to the filter using about 100 cc. water. (The exact amount is immaterial, since only negligible traces of soluble matter remain in this residue.)

Where a centrifuge is not available the filtration is very tedious, and sometimes impossible. It may be necessary, in this case, to use two or more filters, or to work on smaller amounts of the sample. In either case the liability to error is much increased.

The filters, with their contents, may be allowed to stand at the ordinary temperature over night; or they may be at once transferred to a drying oven, kept below 50° C—having a forced draught. In this case there is no danger of gelatinizing the starch, and the drying may be completed in a few hours. When approximately dry, the temperature of the oven may be raised to 90°—95° and the drying completed at this tem-

NOTE.—In order to ascertain how much extractive was taken out by the second treatment with 100 cc. water, I determined the loss of weight after one and two treatments, in sample 17957—and obtained for 1 treatment—19·6 per cent. For 2 treatments—21·4 per cent. It is evident from these figures that a third treatment would be superfluous.

perature. The filters with their contents are then weighed (between watch glasses) the more or less lumpy mass carefully transferred to a small mortar, ground up, returned to the filter, and again dried for an hour or two. The second weighing should not materially differ from the first, and gives the dry, insoluble matter.

In order to show how constant is the extractive matter so obtained, I quote the following work done on four samples. The second estimation was made after an interval of three weeks during which the samples had stood on the heating coils of the laboratory. It will be seen that, by this treatment, they had lost about one-third of their natural hygroscopic moisture.

No.	Moisture.	Extractive.	Calculated on Dry Substance	Mean.
20360—(*a*)	11·24	17·48	19·7	20·0
—(*b*)	7·14	18·76	20·2	
17957—(*a*)	10·74	17·46	19·6	20·5
—(*b*)	7·20	19·80	21·4	
17949—(*a*)	11·60	12·66	14·3	14·0
—(*b*)	8·12	12·68	13·8	
17964—(*a*)	12·30	13·24	15·1	15·2
—(*b*)	7·78	14·32	15·5	

It should be noted that 17957 (*a*) is the result of extraction with only 100 cc. of water; the other extractions represent two treatments with water.

When a sample of ginger is treated with water, as described, the re-dried sample always has a distinctly darker colour than the original. Duplicates which have been similarly treated, yield residues, leaving exactly the same colour. Whether or not it would be safe to infer that a dark coloured sample of ginger had undergone washing and drying, would require larger experience than I have had. But I think it safe to regard dark coloured samples with suspicion; and to insist upon their yielding a normal percentage of extractive matter to cold water.

In the accompanying table it will be noted that the first six samples have a good colour, and with the exception of No. 5, which contains about 20 per cent of wheat flour —yield an extractive of at least 19 per cent of their dry weight. The mean extractive for samples 1 to 6 (omitting No. 5) is 19·7 per cent, the extremes being 18·7 and 21·4 per cent.

Since the remaining samples yield a decidedly lower extractive, under similar treatment, there can be little doubt that they represent ginger rhizomes which have been more or less exhausted with water before grinding; or an admixture of ginger which has been fully exhausted and re-dried. This would account for the decidedly darker colour of these samples.

If these samples represent a natural and unadulterated ginger, of a lower grade than that represented by the other samples, we should have evidence of the fact in our possession. I have not met an authenticated sample of ginger which gave less than about 19 per cent of extractive to cold water, when treated as above described.

A. McGILL.

APPENDIX J.

BULLETIN No. 96—JAMS AND JELLIES.

(Revised and Augmented.)

OTTAWA, May 6, 1904.

W. J. GERALD, Esq.,
Deputy Minister of Inland Revenue.

SIR,—In accordance with your instructions of 14th January last, a collection was made of Jams and Jellies, in the course of that and the following month, in the various collection districts of the Dominion. The accompanying tabulated statement (I) gives full particulars regarding the origin and character of each sample in the order as collected by the various food inspectors, and as the districts succeed each other from east to west. Table I also contains the final result of examining each sample briefly stated by Mr. A. McGill, who, assisted by Mr. Alphonse Lemoine, carried out the analyses. The details of the latter are given in a series of additional tables in which the various samples have been classified according to their nature as follows :

A. Raspberry jam.
B. Strawberry jam.
C. Plum jam.
D. Peach jam.
E. Miscellaneous jams.
F. Jellies.

The analytical results given in these tables regarding the samples may be connected with the descriptions given in Table I by means of each serial number.

The total number of samples collected was 78 but five consisted of "jelly powders" which certain food inspectors purchased by mistake. The number should therefore be 73 but, as a matter of fact, 74 analyses were made owing to sample 2,440, the duplicate of which did not correspond in character with the main sample. The following statement is a classification of the whole 74 samples, based upon the analytical results, it being considered that the presence of foreign fruit, or large percentages of glucose constitutes adulteration :—

	Genuine.	Doubtful.	Adulterated.	Total.
A. Raspberry jam	2	1	16	19
B. Strawberry jam	1	1	17	19
C. Plum jam	3	1	8	12
D. Peach jam	0	2	5	7
E. Miscellaneous	0	0	2	2
F. Jellies	8	0	7	15
	14	5	55	74

The number of adulterated samples in this collection is therefore equal to 74·3 per cent. This figure must be regarded as below the truth, since none of the samples were condemned on account of the use only of preservatives or artificial dyes. The position

of this branch regarding the adulteration of jams and jellies may here be stated. They are, as Webster defines jam, the products of boiling fruits with sugar and water. The only word in this definition about which any doubt can exist is the word "sugar". This is defined by the same authority as 'a sweet crystalline substance, obtained from certain vegetable products, as the sugar cane, maple, beet, sorghum, and the like.' This identifies sugar as the substance known to chemists under the names cane sugar, or sucrose. Commercial glucose is not grape sugar, but a product of the action of acids on starch, of very indefinite composition, always containing, as well as reducing sugars, dextrine, water, &c. Every grocer and consumer understands quite well what is meant by sugar, and the substitution of commercial glucose for it in ordinary trade would not be tolerated. It is also to be remembered that reputable manufacturers of jams and jellies use only cane sugar in preserving.

Similar views to the foregoing prevail in other countries and more especially among the Boards of Health in the United States.

In general the rulings of the latter are to the effect that fruit jellies, preserves, canned fruits &c., must consist of the fruit specified on the label of the package, preserved only with cane sugar, and must not contain artificial flavours, colouring matters or preservatives. If such articles contain any substitute for the fruit, or any material to make bulk or weight they are considered to be adulterated.

I have the honor to be, sir,

Your obedient servant,

THOMAS MACFARLANE,

Chief Analyst.

INSPECTION OF JAMS AND JELLIES—TABULATED STATEMENT (I.)

Date of Collection.	Nature of Sample.	No. of Sample.	Name and Address of Vendor.	Cost. Quantity.	Cost. Price.	Name and Address of Manufacturer or Furnisher.	Opinion of Analyst.	Serial No.
1904.			*District of Halifax, &c.*		$ cts.			
Jan. 27	Cranberry jam	20420	John Riley, Windsor, N.S.	3 pks.	0 45	Charlottetown Preserving Co., P. E.I.	Adulterated, containing glucose and a coal-tar dye	58
" 27	Greengage plum jam	20423	Grahame & Co., Windsor, N.S.	3 "	0 60	Crosse & Blackwell, London, Eng	Genuine	39
27	Plum jam	20427	Shand Bros., Windsor.	3 "	0 25	Canada Biscuit Co., Toronto.	Contains a little glucose, and a coal-tar dye. Otherwise genuine	40
" 27	"	20428	W. Smith, Kentville, N.S.	3 "	0 45	Upton's	Contains some glucose, and a preservative. Adulterated	41
" 27	Red currant jelly	20429	" "	3 "	0 60	A. Cairns, Eng	Contains salicylic acid. Otherwise genuine	60
" 27	Apple jelly	20430	DeWolfe & Lamont, Kentville, N.S.	3 "	0 45	Miss Taylor, Kentville, N.S.	Genuine	61
" 27	Plum jelly	20431	" "	3 "	0 40	A. Gooderville & Sons, Welland, Ont.	Adulterated with glucose, and contains salicylic acid	62
" 27	Peach jam	20439	Burgess Quinn, Halifax	3 "	0 30	Canada Preserving Co., Hamilton, Ont.	Adulterated, containing glucose	51
			District of Prince Edward Island.					
" 26	Jam	24101	A. Gates & Co., Charlottetown	3 crocks	0 36	Upton's, Montreal.	Adulterated with glucose and dyed	31
" 27	Jelly	24105	J. Ching, Summerside.	3 "	0 45	Central Preserving Co., Boston, Mass.	Adulterated with glucose.	71
" 27	Jam	24107	J. N. Locke, Summerside	3 tins.	0 54	J. W. Windsor, Montreal.	Adulterated with glucose, is dyed, and contains salicylic acid.	11
" 28	Jelly	24108	Sanderson & Co.	3 crocks	0 84	Crosse & Blackwell, London, Eng.	Genuine	72
			District of New Brunswick.					
" 22	Strawberry jam	23805	Baird & Peters, St. John, N.B.	3 jars	0 30	Simcoe Canning Co., Simcoe, Ont	Adulterated with glucose and contains a coal-tar dye	28
" 22	Red currant jelly	23806	W. A. Porter, Cor. Waterloo and Union Sts., St. John.	3 "	0 90	Chas. Southwell & Co., London, Eng	Genuine	66

"	26	Plum jam	23811	Chas. C. Philips, Cor. Douglas Ave. and Main St., St. John	3	jars	0 54	H. Goodwillie & Sons, Welland, Ont.	Adulterated with glucose and contains salicylic acid	49
"	28	Crab apple jelly	23812	R. O. McLean & Co., 293 Main St., Moncton, N.B.	3	tumb's	0 45	Vendors	Genuine	67
Feb.	4	Peach jam	23817	Hugh McKenna, King St., St. Stephen	3	jars	0 45	R. Goodwillie & Sons, Welland, Ont.	Adulterated with glucose and contains salicylic acid	55
"	5	Cranberry jelly	23820	Enoch G. Hoben, York St., Fredericton	3	tumb's	0 45	David C. Parent, Queensbury, York	Genuine	68
				District of Quebec.						
Jan.	25	Raspberry jam	23649	George Beausoleil, Terrebonne, Que.	4	lbs.	0 40	J. W. Windsor, Montreal	Adulterated with glucose and foreign fruit; contains salicylic acid and a coal tar dye	6
"	26	Strawberry jam	23655	Ed. Carlloux, Joliette, Que.	3	jars	0 45	S. P. Champaux, Joliette	Adulterated with glucose and contains salicylic acid	24
"	26	Raspberry jam	23656	Oscard Roy, Joliette	1	can	0 15	W. B. Newsome & Co., Montreal	" "	7
"	27	Plum jam	23658	A. L. Caisse, Berthierville	1	lb.	0 40	Canada Preserving Co., Hamilton	Adulterated with glucose and is dyed	45
"	27	Raspberry jam	23660	Coulombe & Lefebvre, Berthierville.	1	can	0 15	Jos. Lamoureux, Montreal	Adulterated with glucose or foreign tissues; is dyed	8
"	28	Strawberry jam	23664	Bellefeuille & Giroux, Trois Rivières	1	pail	0 50	Royal Packing Co., Montreal	Contains glucose and contains salicylic acid, but is sold as compound	25
"	28	Plum jam	23665	S. H. Frigon & Cie, Trois Rivieres	1	"	0 50	J. A. Perrault, Montreal	Adulterated with glucose and contains salicylic acid	46
"	28	"	23667	L. Brunelle & freres, Trois Rivieres	3	cans	0 45	Jos. Lamoureux, Montreal	Adulterated with glucose and contains a preservative and a dye	47
"	29	Strawberry jam	23666	L. Gingras, 304 Richelieu St., Quebec	3	jars	0 30	L. Letourneau, Quebec	Adulterated with glucose and contains a coal tar dye	26
"	29	Raspberry jam	23673	Chas. J. Boily, 404 St. Valier, Quebec	2	cans	0 30	Montreal Canning and Preserving Co.	Adulterated with glucose and foreign fruit tissues	9
"	29	Strawberry jelly	23678	Thos. Smyth, Quebec	3	pks	0 30	Weir Specialty Co., agents, Toronto	Labelled 'Oliver's Concentrated Jelly Crystals'	
Feb.	4	Plum jam	23680	J. V. Montplaisir, Drummondville	1	jar	0 45	Himself	Genuine	48
"	4	Strawberry jam	23687	Alex. Dufresne, St. Joseph de St. Hyacinthe	2	cans	0 28	J. A. Perrault, Montreal	Adulterated with glucose and foreign tissues; is dyed	27
				District of Montreal.						
Jan.	20	Upton's strawberry jam	23286	A. Fournier, 1789 St. Catherine St.	3	jars	0 30	Uptons	Adulterated with glucose and contains a coal tar dye	22
"	20	Graham's raspberry jam	23287	C. E. Acethier, 1758 St. Catherine St.	3	"	0 30	Canada Preserving Co.	Adulterated with glucose and foreign fruit tissue; is dyed	3
"	20	Strawberry jam	23288	L. G. Thouin, 487 Lagauchetière St	3	"	0 15	W. B. Newsome Co, 84 Youville Square, Montreal	Adulterated with glucose and contains salicylic acid	23
"	21	Plum jam	23289	M. F. Lafortune, 116 St. Maurice St.	3	"	0 30	Lamoureaux & Co.	Adulterated with glucose and is dyed	42

Date of Collection.	Nature of Sample.	No. of Sample.	Name and Address of Vendor.	Cost. Quantity.	Cost. Price.	Name and Address of Manufacturer or Furnisher.	Opinion of Analyst.	Serial No.
1904.			*District of Montreal*—Con.		$ cts.			
Jan. 21	Raspberry jelly...	23290	Pilons & Meilleur, 114 St. Maurice St..	3 jars...	0 15	Not known..	Adulterated with glucose and is dyed.....	64
" 21	Mrs. Luke's home made crab apple jelly.....	23291	A. Lamy, 2021 Notre Dame St.....	3 " ..	0 30	Mrs. Luke, Montreal,.	Genuine.....	65
" 21	Plum jam	23292	" " ..	3 " ..	0 30	Uptons.....	Adulterated with glucose and is dyed.....	43
" 21	Crown brand plum jam*..... ...	23293	M. Kilkerry, 701 Craig St.....	3 " ..	0 39	The Royal Packing Co., Montreal	Contains glucose, contains salicylic acid, and is dyed*..	44
" 21	Lily brand raspberry jam.....	23294	Joseph Deneau, 53 Jurors St	3 " .	0 30	....	Adulterated with glucose and foreign fruit	4
" 22	Peach jam	23295	A. Massicotte & Co., 1472 St. Catherine St	2 " ..	0 50	Paquet et Paquet, Montreal.....	Adulterated with glucose.....	53
" 22	Raspberry jam....	23296	T. Bergeron, 1522 St. Catherine St....	3 " ..	0 45	" "	" "	5
" 22	Peach jam, King's brand	23297	G. St. Pierre, 1350 Notre Dame St.....	3 " ..	0 45	....	" "	54
			Kingston District.					
" 28	Strawberry jam...	25015	Peter Glavey, 37 York St., Ottawa.....	2½ lbs..	0 38	Upton's ; taken from a 10-lb. pail	Adulterated with glucose and foreign fruit. Dyed.....	34
" 28	Raspberry jam....	25016	P. L. Foisy. 297 Dalhousie St., Ottawa.	3 " ..	0 30	D. C. Brosseau & Co.; taken from a 10-lb. pail.....	Adulterated with glucose and dyed; contains very little fruit	15
" 29	Peach jam.....	25017	Wm. Rhodes, King St., Brockville....	3 jars..	0 30	Upton's	A little glucose. Doubtful.. . .	56
Feb. 1	Red currant jam..	25018	T. H. Johns, Princess St., Kingston...	3 " ..	0 30	Simcoe Canning Co	Adulterated with glucose, and dyed.	59
" 1	Strawberry jam...	25019	James Crawford, Princess St., Kingston	3 " ..	0 30	Hamilton Preserving Co.....	Adulterated with glucose and foreign fruit. Contains salicylic acid and a coal tar dye.....	35
" 1	Raspberry jam....	25020	" " ..	3 " ..	0 30	"	Adulterated with glucose and foreign tissues. Is dyed.	16
" 1	Red currant jelly..	25021	W. R. McRae & Bros., Brock St., Kingston	3 " ..	0 30	Godwillie & Sons, Welland .. .	Adulterated with glucose, and contains salicylic acid.....	74

				Toronto District.						
Feb.	2	Raspberry jam...	25042	Jno. Irvine, 552 Queen W., Toronto....	3	jars..	0 30	L. S. Rosemary Co., Hamilton...	Adulterated with glucose and foreign tissues. Contains salicylic acid	17
"	2	Strawberry jam ..	25043	J. Bonel, 559 Queen W., Toronto	3	" ..	0 30	Montreal Canning Co..	Adulterated with glucose	36
"	2	Raspberry jam ...	25044	A. Ganathu & Co., 400 Queen W., Toronto	3	" ..	0 25	Beasley Bros	Adulterated with glucose and foreign fruit tissues. Is dyed.....	18
"	2	Strawberry jam...	25045	" " ..	3	" ..	0 25	"	Contains some glucose. Doubtful.	37
"	3	Raspberry jam....	25046	C. Lee, 101 King E., Hamilton.....	3	" ..	0 30	McCormick Mfg. Co.	Adulterated with glucose and foreign fruit	19
"	3	Peach jam..	25047	" "	2½	lbs..	0 25	Taken from 10-lb. jar.....	Contains a little glucose. Doubtful.	57
"	3	Plum jam.....	25048	J. H. Horning, 92 John St., Hamilton.	3	jars..	0 30	Can. Preserving Co.....	A little glucose and dyed. Doubtful...	50
"	3	Strawberry jam...	25049	" " ..	3	lbs..	0 30	Standard Canning Co.....	Adulterated to a slight extent with glucose and dyed..	38
				London District.						
Jan.	23	Jelly, ...	22185	B. B. Gunn, Seaforth.....	3	pks..	0 30	Hamilton Coffee & Spice Co., Hamilton.....	Labelled "McLaren's invincible powdered vanilla jelly.".....	
"	27	Strawberry jam...	22188	Ed. O'Flaherty, Stratford.... . .	3	" ..	0 30	Belford & Co., Hamilton.....	Adulterated with glucose, and dyed	21
"	28	Peach jam.....	22194	Scroggie Bros., Guelph	3	pots..	0 30	McCormack & Co., London.. ...	Adulterated with glucose.....	52
"	28	Red currant jelly .	22195	J. A. McCrae, Guelph	3	" ..	0 30	T. A. Littell & Co., Toronto.....	Genuine.....	63
"	29	Pure Gold Jelly 'Orange'.	22197	T. S. Armstrong, Fergus, Ont....	3	pks..	0 25	Pure Gold Mfg. Co., Toronto...	Labelled "Pure Gold Jelly prepared in a finely powdered form."	
"	29	Calfs foot jelly...	22198	"	3	" ..	0 25	Gorman Eckart & Co., London, Ont	Labelled "Oriental Jelly Powder."	
Feb.	6	Raspberry jam....	22203	John Bettie, Seaforth	3	jars..	0 30	Delhi Canning Co.....	Genuine jam, contains salicylic acid.....	2
"	8	Grape jelly..... .	22206	Sturdy & Co.. Goderich..	3	" ..	0 30	Crown Mfg. Co., Toronto.....	Labelled "Crown Jelly in powdered form."	
				Winnipeg District.						
"	9	Jelly.....	23925	J. Bower & Co., Brandon....	1½	" ..	0 30	White Star Mfg. Co., Winnipeg.	Adulterated with glucose ; is preserved with salicylic acid, and is dyed	69
"	10	Jam..	23929	W. J. Wilcox & Co., Virden..... ..	1½	" ..	0 25	Upton's, Hamilton	No description or claim with this sample.	29
"	12	Strawberry jam...	23932	Hardy & Buchanan, Winnipeg..... . .	3	" ..	0 75	"	Contains some glucose and a preservative. Doubtful..	30
"	12	Jelly...	23934	Williamsons Bros., Winnipeg.... ...	3	" ..	0 30	White Star Mfg. Co., Winnipeg .	Contains much glucose ; is dyed and contains salicylic acid. Adulterated..	70
				Calgary District.						
"	10	Raspberry jam ...	21778	Groat & Elliott, Strathcona, Alta.....	3	bots..	0 75	Ely Blands, Toronto, Ont... .	Genuine jam ; but contains a preservative, and is dyed	1
"	11	Strawberry jam...	21782	H. N. Dodd, Edmonton, Alta....	3	" ..	0 75	Canada Preserving Co., Hamilton.	Adulterated with glucose and dyed.	20

* The word "compound" is printed on bottom of label, barely noticeable.

INSPECTION OF JAMS AND JELLIES—TABULATED STATEMENT (I.)—*Concluded.*

Date of Collection.	Nature of Sample.	No. of Sample.	Name and Address of Vendor.	Cost. Quantity.	Cost. Price.	Name and Address of Manufacturer or Furnisher.	Opinion of Analyst.	Serial No.
1904.			*British Columbia District.*		$ cts.			
Feb. 2	Strawberry jam...	24922	Geo. Wagg, Vancouver.....	15 lbs...	1 50	J. W. Windsor, Montreal.. . ..	Adulterated with glucose and foreign fruit; contains salicylic acid, and is dyed	32
" 4	Raspberry jam....	24923	McCulloch Bros., Vancouver	15 " ..	1 40	Simcoe Canning Co., Ontario ...	Adulterated with glucose and foreign fruit tissues; is dyed.....	12
" 4	Red currant jelly..	24925	City Grocery Co., Vancouver.....	15 " .	1 05	Windsor, Montreal.....	Adulterated with much glucose and is dyed.	73
" 5	Raspberry jam ...	24926	J. P. Nightingale & Co., Vancouver...	15 " ..	1 50	Pure Gold Mfg. Co., Toronto....	A genuine jam, but contains foreign fruit tissue...	13
" 5	" ..	24927	London Grocery Co., Vancouver. .	15 " ..	1 50	B.C. Fruit Canning & Coffee Co.	Adulterated with glucose and contains salicylic acid...	14
" 5	Strawberry jam...	24928	F. Wright, Vancouver.	15 " .	1 50	Odell & Morris, Victoria, B.C....	Genuine, but contains salicylic acid.	33

TABULAR RESULTS

OF

ANALYSIS OF JAMS AND JELLIES

A.—RASPBERRY

Serial Number.	Departmental Number.	Solids, Per Cent.			Water.	Alcohol Precipitate.		Polarization, 15 per cent Solution.			
		Insoluble.	Soluble.	Total.		Per Cent.	Character.	Direct.	Invert.	Difference.	Invert (1) Reading calculated to Normal.
1	21778	4·24	50·52	54·76	45·24	2·80	Clear and free	+ 3·0	— 7·7	10·7	— 26·4
2	22203	5·85	63·00	68·85	31·15	1·04	" ..	— 1·0	— 9·9	8·9	— 27·2
3	23287	2·34	62·90	65·24	34·76	21·16	Milky, sticky	+31·0	+16·5	14·5	+ 45·3
4	23294	1·74	55·50	57·24	42·76	30·73	" ..	+35·0	+22·0	13·0	+ 70·0
5	23296	1·78	69·12	70·90	29·10	30·91	" ..	+69·0	+64·9	4·1	+163·0
6	23649	1·58	67·66	69·24	30·76	24·70	" ..	+57·0	+46·3	10·7	+117·0
7	23656	1·06	73·50	74·56	25·44	2·85	" ..	+43·0	+29·7	13·3	+ 70 0
8	23660	3·75	71·00	74·75	25·25	19·00	" ..	+53·0	+32·5	20·5	+ 84·0
9	23673	1·92	67·94	69·86	30·14	38·53	" ..	+40·0	+37·4	2·6	+ 94·1
*10	24401	1·56	64·50	66·06	33·94	30·79	" ..	+33·0	+20·9	12·1	+ 56·9
11	24407	1·19	72·16	73·35	26·65	51·64	" ..	+65·0	+55·0	10·0	+132·0
12	24923	1·56	70·54	72·10	27·90	31·09	Milky, sticky	+39·4	+29·7	9·7	+ 74·0
13	24926	1·77	67·66	69·43	30·57	2·15	Clear and free	+ 2·0	—11·7	13·7	— 31·0
14	24927	1·18	67·65	68·83	31·17	38·89	Milky, sticky	+37·0	+23·8	13·2	+ 61·0
15	25016	0·19	73·50	73·69	26·31	64·56	" ..	+81·5	+71·5	10·0	+170·0
16	25020	1·49	62·90	64·39	35·61	20·01	" ..	+49·5	+47·3	2·2	+130·0
17	25042	1·41	54·36	55·77	44·23	10·68	" ..	+34·0	+25·3	8·7	+ 80·0
18	25044	3·00	57·18	60·18	39·82	23·35	" ..	+14·0	+ 9·9	4·1	+ 30·3
19	25046	1·49	59·98	61·47	38·53	16·20	" ..	+25·0	+10·5	14·5	+ 30·3

(1) The numbers in this column are calculated for 26·048 grammes of dry, soluble solids dissolved to

(See page 127.)

* The duplicate of this number is a Strawberry jam.

NOTE.—Jams should be made with cane sugar, unless a formula defining the composition is given.

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JAM, APRIL, 1904.

Sugars.			Preservatives.	Coal Tar Dyes.	Remarks.	Approximate per cent Glucose.	
Cane.	Reducing.	Total.				Dry Glucose in Sugar.	Commercial Glucose in Jam.
14·0	37·0	51·0	Salicylic..	Present..	Genuine fruit. Genuine jam, but contains a preservative, and is artificially dyed.	..	..
11·6	46·6	58·2	" ..	None ...	Raspberry fruit only. Genuine jam, with a preservative.	..	..
18·8	34·3	53·1	None	Present..	Raspberry and foreign tissue; apparently apple. Adulterated.	30	25
17·0	27·2	44·2	"	None	Raspberry and foreign tissue: apparently apple. Adulterated.	40	30
5·4	34·1	39·5	"	"	Genuine fruit. Adulterated with glucose. ..	75	60
14·0	29·9	43·9	Salicylic..	Present..	Raspberry and foreign tissue; apparently apple. Adulterated.	65	50
17·4	41·5	58·9	" ..	..	Genuine fruit. Adulterated. ..	40	30
26 6	26·1	52·7	None	..	Raspberry tissue and pips of foreign fruit; apparently fig or strawberry. Adulterated.	45	35
3·4	44·4	47·8	"	Doubtful..	Raspberry tissue and foreign tissue (Apple?). Adulterated.	50	35
15·8	36·6	52·4	Salicylic..	Present..	Genuine fruit. Adulterated with glucose, and dyed.	35	25
13·0	33·5	46·5	" ..	..	Genuine fruit. Adulterated. ...	65	50
12 8	37·7	50·5	None	..	Raspberry tissue and apparently apple pulp. Adulterated.	40	30
17·8	46·9	64·7	"	None ...	Raspberry tissue and foreign tissue, apparently apple. A genuine jam, but not entirely of raspberry fruit.	..	..
17·0	40·7	57·7	Salicylic..	"	Genuine fruit. Adulterated. ..	35	25
13·0	34·0	47·0	None	Present..	Raspberry tissues. Adulterated, contains very little fruit.	80	60
2·8	37·5	40·3	"	..	Raspberry and foreign tissues, apparently apple pulp. Adulterated.	65	50
11·4	28·2	39·6	Salicylic..	None	Raspberry and foreign tissue, apparently apple. Adulterated.	45	35
5·4	44·0	49·4	None	Present..	Raspberry tissues and foreign tissues (Apple?). Adulterated with glucose, etc.	25	20
18·8	39·8	58·6	"	None ..	Raspberry and foreign tissue, apparently apple. Adulterated with glucose, etc.	25	20

100 cc.; and they form the data by which the glucose percentage in the jam is approximately ascertained

A. McGILL.

B.—STRAWBERRY

Serial Number.	Departmental Number.	Solids, Per Cent.			Water.	Alcohol Precipitate.		Polarization.			
		Insoluble.	Soluble.	Total.		Per Cent.	Character.	Direct.	Invert.	Difference.	Invert (1) Reading to Normal.
20	21782	1·01	63·82	64·83	35·17	35·3	Sticky	+41·5	+21·5	20·0	+ 58·1
21	22188	1·71	54·44	56·15	43·85	18·9	"	+24·5	+10·5	14·0	+ 33·7
22	23286	0·69	64 94	65·63	34·37	47·9	"	+32·0	+18·7	13·3	+ 49·8
23	23288	0·66	68·82	69·48	30·52	50·1	" ...	+30·5	+29·7	9·8	+ 75·2
24	23655	1·01	70·62	71·63	28·37	13·8	"	+39·5	+19·8	12·7	+ 48·8
25	23664	1·93	72·26	74·19	25·81	26·5	"	+60·0	+45·7	14·3	+110·5
26	23668	1·24	60·94	62·18	37·82	33·3	"	+60·0	+58·9	1·1	+167·3
*27	23687	2·96	71·80	74·76	25·24	19·1	"	+52·0	+35·2	16·8	+ 84·1
28	23805	2·21	60·10	62·31	37·69	19·2	"	+38·5	+24·4	14·1	+ 70·9
29	23929	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
30	23932	2·06	61·30	63·36	36·64	4·69	Sticky	+33·0	+19·8	13·2	+ 56·7
†31	24401	0·96	58·60	59·56	40·44	11·9	"	+30·5	+18·2	12·3	+ 52·7
32	24922	0·67	73·20	73·87	26·13	42·8	"	+61·0	+47·9	13·1	+114·0
33	24928	2·21	71·08	73·29	26·71	1·4	Free.....	+16·0	--12·7	28·7	— 31·7
34	25015	1·01	69·74	70·75	29·25	9·4	Sticky	+26·5	+11·0	15·5	+ 27·2
35	25019	1·69	64·18	65·87	34·13	23·4	"	+49·0	+44·6	4·4	+121·7
36	25043	2·23	70·82	73·05	26·95	22·2	"	+51·0	+41·8	9·2	+102·4
37	25045	1·75	59·84	61·59	38·41	5·9	"	+16·5	+8·8	7·7	+ 26·0
38	25049	2·05	63·30	65·35	34·65	7·8	"	+23·0	+10·4	12·6	+27·5

*This sample is contained in a pasteboard carton, which has been opened, and about two-thirds of the sale.

(1) The numbers in this column are calculated for 26·048 grammes of dry, soluble solids, dissolved to (See page 127).

†The duplicate of this number is a raspberry jam.

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JAM, APRIL, 1904.

Sugars.			Preservatives.	Coal Tar Dyes.	Remarks.	Approximate per cent Glucose.	
Cane.	Reducing.	Total.				Dry Glucose in Sugar.	Commercial Glucose in Jam.
26·0	25·0	51·0	None.....	Present...	Strawberry tissues only. Adulterated.....	35	28
18·2	32·3	50·5	"	" ...	" " "	25	17
17·2	39·2	56·4	" ...	" ...	" " "	30	24
13·0	54·3	67 3	Salicylic..	Doubtful .	" " "	45	32
16·6	42·3	58·9	" ..	None.....	" " "	30	26
18·6	33·2	51·8	" ..	Present...	" and foreign tissues "	60	54
1·4	32·8	34·2	None.....	" ...	" tissues only "	80	60
21·8	32·4	54·2	"	" ...	" and foreign tissue. Apparently apple. Adulterated.	45	40
18·4	27·0	45·4	"	" ...	" tissues only. Adulterated.....	40	30
.....	.....	.....	.....	.....	No description or claim with this sample.....	.....	.....
17·0	31·7	48·7	Salicylic..	Doubtful .	Strawberry tissues only. Adulterated to a slight extent.	35	27
16·0	38·0	54·0	None.....	Present...	" tissues only. Adulterated.....	35	26
16·8	35.4	52·2	Salicylic..	" ...	" and foreign tissues "	55	50
37·4	36·2	73.6	" ..	" ...	Cane sugar crystallized out. Strawberry tissues only. Genuine.	.....	.....
20·2	41·4	61·6	None.....	" ...	Strawberry and foreign tissues, probably apple. Adulterated.	25	22
5·8	39·2	45·0	Salicylic..	" ...	" " " " ..	65	52
12·0	39·9	51 9	None....	None.....	" tissues only. Adulterated.	55	48
10·0	42·9	52·9	"	Doubtful .	" " " to a slight extent with glucose.	25	19
16·4	37·6	54·0	"	Present...	" tissues only. Adulterated to a slight extent with glucose and dved.	25	20

contents removed. The remainder is very dry, and is evidently not in a normal condition, as offered for 100 cc.; and they form the data by which the glucose percentage in the jam is approximately ascertained.

A. McGILL.

C.—PLUM JAM,

Serial Number.	Departmental Number.	Solids, per cent.			Water.	Alcohol Precipitate.		Polarization.			
		Insoluble.	Soluble.	Total.		Per Cent.	Character.	Direct.	Invert.	Difference.	Invert ‡ reading to normal.
39	20423	No stones, 0·79	68·36	69·15	30·85	2·6	Free.....	+15·0	— 9·9	24·9	—25·4
40	20427	3 " 3·72	58·36	62·08	37·92	9·0	Slightly st'ky	+16·2	—10·4	26·6	—30·0
41	20428	4 " 5·00	59·78	64·78	35·22	3.5	"	+14·5	+12·1	2·4	+34·6
42	23289	No " 0·62	71·60	72·22	27·78	44·2	Sticky.....	+55·0	+35·2	19·8	+84·1
43	23292	1 " 1·80	62·50	64·30	35·70	12·2	"	+33·0	+17·0	16·0	+47·0
44	23293	6 " 11·40	64·18	75·58	24·42	22·3	"	+39·6	+30·3	9·3	+81·0
45	23658	4 " 6·94	56·30	63·24	36·76	6·5	Slightly st'ky	+23·0	+13·2	9·8	+40·1
46	23665	9 " 7·80	57·60	65·40	34·60	25·5	Sticky.....	+35·5	+33·0	2·5	+98·4
47	23667	11 " 15·23	59·32	74·55	25·45	25·4	"	+33·0	+20·5	12·5	+60·1
48	23680	7 " 7·00	46·06	53·06	46·94	1·5	Free & clean.	— 4·0	— 4·4	0·4	—16·5
49	23811	4 " 9·45	53·36	62·81	37·19	7·2	Slightly st'ky	+16·0	+14·1	1·9	+46 0
50	25048	4 " 4·18	59·80	63·98	36·02	5·6	"	+16·2	+ 7·2	9·0	+20·7

D.—PEACH JAM,

51	20439	No stones, 1·19	62·74	63·93	36·07	13·2	Sticky.....	+33·5	+14·3	19·2	+38·4
52	22194	" 1·24	68·94	70·18	29·82	10·2	"	+27·5	+12·1	15·4	+30·1
53	23295	" 2·83	68·98	71·81	28·19	52·6	"	+68·0	+58·3	9·7	+145·0
54	23297	2 " 10·48	64·22	74·70	25·30	22·7	"	+48·0	+28·6	19·4	+78·4
55	23817	No " 1·23	52·50	53·73	46·27	8·4	"	+16·0	+ 8·8	7·2	+30·0
56	25017	" 0·88	62·60	63·48	36·52	11·5	"	+22·0	+ 7·7	14·3	+22·0
57	25047	" 3·37	59·10	62·47	37·53	2·7	Free.....	+18·0	— 7·0	25·0	—20·5

MISCELLANEOUS

*58	20420	3·27	52·12	55·39	44·61	15·4	Sticky.....	+32·5	+31·7	0·8	+106·5
†59	25018	3·19	58·70	61·89	38·11	15·8	"	+44·0	+35·4	8·6	—102·6

* Cranberry jam.
† Red Currant jam.
‡ The numbers in this column are calculated for 26·048 grammes of dry, soluble solid disolved to 100 cc; and they form the data by which the glucose percentage is approximately ascertained. (See page 127.)

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Sugars.			Preservatives.	Coal Tar Dyes.	Remarks.	Approximate per cent Glucose.	
Cane.	Reducing.	Total.				Dry Glucose in Sugar.	Commercial Glucose in Jam.
32·4	36·0	68·4	None.....	None.....	No stones.	Fruit tissues. Genuine.....	0	0
34·6	25·5	60·1	"	Present...	3 "	A little glucose. Genuine but dyed.	0	0
3·2	36·2	39·4	Salicylic..	None.....	4 "	per 100 grms. Contains some glucose, and a preservative. Adulterated.	25	19
25·8	29·0	54·8	None.....	Present...	No "	Contains much glucose and is dyed. Adulterated.	45	40
20·8	32·4	53·2	"	" ..	1 "	per 100 grms, mouldy. Contains glucose, and is dyed. Adulterated.	30	23
12·0	38·7	50·7	Salicylic..	" ..	6 "	per 100 grms., glucose and a preservative. Adulterated.	45	36
12·8	30·1	42·9	None. ...	" ..	4 "	per 100 grms, some glucose. Adulterated.	25	18
3·2	39·4	42·6	Salicylic..	None.....	9 "	" " glucose, and a preservative. Adulterated.	50	36
16·2	33·3	49·5	" ..	Present...	11 "	flesh adherent in 5. Glucose and a preservative. Adulterated.	35	26
0·6	43·6	44·2	None...	None.....	7 "	flesh free, slight mould. Genuine.	5	3
2·4	43·2	45·6	Salicylic..	"	4 "	flesh adherent in 2. A little glucose, and a preservative. Adulterated.	30	20
11·8	42·4	54·2	None.....	Present...	4 "	flesh free. A little glucose and dyed. Doubtful.	15	11

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25·0	30·3	55 3	None	None	No stcnes.	Glucose.	Adulterated.....	25	20
20·0	41·6	61·6	"	" ..	"	"	"	20	17
12·6	32·1	44·7	" ...	"	"	"	"	70	60
25·2	23·2	48·4	Benzoic?..	"	2 "	"	"	45	36
9·4	37·4	46·8	Salicylic ..	"	No "	"	and a preservative. Adulterated.	25	.....
18·6	36·6	55·2	None	"	Mouldy.	A little glucose.	Doubtful.	20	16
32·6	20·5	53·1	"	"	"	"	"	5	3

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1·0	38·2	39·2	None	Present ..	Glucose.	Adulterated .	.....	55	36
11·2	30·5	41·7	"	" ..	"	"	.....	55	41

F.—ANALYTICAL data on

Serial Number.	Number.	Dry Solids, per cent.	Acidity stated as H_2SO_4.	SUGARS—PER CENT.			POLARIZATIONS. (3)			ALCOHOL PRECIPITATE.		
				Reducing. (2)	Cane.	Total.	Direct.	Invert.	Temp. C.	Per cent.	Character.	Invert (1) Reading to Normal Weight.
60	20429	66·78	·098	41·1	24·6	65·7	+ 7·0	— 9·5	20	1·25	Clear and free...	— 28·4
61	20430	60·90	·125	47·2	9 2	56·4	— 4·0	—10·1	21	3 40	Clear, coherent..	— 33·1
62	20421	67·84	·098	49·5	4·2	53 7	+19·8	+17·0	20	20·65	Milky and sticky	+ 50·0
63	22195	65·76	·031	20·2	47·2	67·4	+22·0	— 9·6	20	0·65	Clear and free...	— 29·1
64	23290	58·32	·010	7·4	42·2	49·6	+32·1	+ 2·9	12	22·90	Milky and sticky	+ 10·0
65	23291	61·12	·045	18·0	41·2	59·2	+20·0	— 7·9	18	0·95	Clear, coherent..	— 26 0
66	23806	69·02	·131	52·6	11·8	64·4	— 1·3	— 9·2	21	4 95	" " ..	— 28·1
67	23812	66·00	·029	56·3	2·0	58·3	— 3·8	— 5·0	12	12·10	Clear and sticky	— 15·1
68	23820	54·76	·054	47·2	4·2	51·4	— 2·2	— 5·0	20	1·50	Clear and free...	— 18·2
69	23925	63·84	·064	31·8	0·6	32 4	+55·0	+54·6	15	47·90	Milky and sticky	+171·0
70	23934	61·80	·053	31·6	6·0	37·6	+63·5	+59·4	15	57 95	" ..	+191·6
71	24405	75·16	·054	37·5	4·0	41·5	+72·0	+69 3	20	48·15	Clear and sticky	+185·0
72	24408	69·60	·069	46·0	20·0	66 0	+ 3·8	—10·0	12	2·30	Clear, coherent..	— 28·6
73	24925	73·98	·040	35·2	10·0	45·2	+56·0	+49 3	20	65·75	Milky and sticky	+133·2
74	25021	73·54	·140	51·7	4·6	56·3	+23·0	+19·8	20	37·25	" ..	+ 53·5

(1) For solutions of 13,024 grammes of the sample in 100 cc.
(2) Calculated as dextrose.
(3) The numbers in this column are ealculated for 26,048 grammes of dry solids dissolved to 100 cc., and they form the data by which the glucose percentage is approximately ascertained.—(See page 127).

MEMORANDUM ON JELLIES.

OTTAWA, March 8, 1904.

The most complete research into the characters of fruit jellies, to which I have access, is contained in Bulletin 66 of the Bureau of Chemistry, at Washington. The data presented in the accompanying table have been obtained by the methods recommended in the bulletin referred to. In addition to the results tabulated, I may state (1) that no reaction for starch was given by any of the fifteen jelly samples examined; (2) that fruit pulp was found in the following samples: 20429, 20430, 23291, 23806, 23820, 24405, 24408; (3) that the ash of all samples gave very distinct reactions for sulphuric acid, and very faint reaction for hydrochloric acid.

The absence of pulp in jelly is not proof that it is not made from fruit, because the fineness of the texture of the jelly-bag or strainer, and the care with which it has been used, are factors in the case.

The following samples appear to be genuine, in the sense of being made with cane sugar, having no preservative, and no artificial dye:—Nos. 20430, 22195, 23291, 23820, 24408.

To this list may be added Nos. 23806 and 23812, since the small quantity of glucose found cannot be condemned, and it is claimed by manufacturers that the addition of small amounts of glucose is desirable to prevent crystallization of the sugars; a (U. S. Bulletin 66, p. 78) claim, however, which appears to be without justification in fact.

The following samples are adulterated in the sense that glucose has been largely used in their manufacture, instead of the more expensive cane sugar:—Nos. 20431, 23290,

Jellies, March 8, 1904.

Sugar, free solids.	Ash. Per cent.	Ash. Alkalinity as K_2CO_3.	Preservatives	Artificial Colouring matter.	Remarks.	Number.	Serial Number.	Approximate p. c. Glucose. Dry glucose in Sugars.	Approximate p. c. Glucose. Comml. Glucose in Jelly.
1·08	·440	·317	Salicylic acid	None.....	Fruit jelly, containing a preservative.....	20429	60	0	0
4·50	·560	·448	None.....	"	Genuine fruit jelly.....	20430	61	0	0
13·14	·350	·297	Salicylic acid	"	Contains glucose, and is preserved with salicylic acid ..	20431	62	35	29
.....	·170	·109	None	Doubtful	Genuine.....	22195	63	0	0
8·72	·840	·343	"	Much	Contains glucose and is dyed.	23290	64	10	7
1·92	·300	·203	"	None.	Genuine.....	23291	65	0	0
4·62	·530	·385	"	"	Genuine, with a trace of glucose	23806	66	0	0
7·7	100	·104	"	"	Contains a trace of glucose...	23812	67	5	4
3·36	·160	·124	"	"	Genuine.....	23820	68	0	0
31·44	·770	·238	Present... ..	Salicylic acid..	Contains much glucose, is preserved with salicylic acid, and artificially dyed....	23925	69	80	62
24·20	·600	·200	"	"	" " ..	23934	70	85	66
33·66	·620	·119	None	None...	Contains much glucose. ...	24405	71	85	80
3·60	·360	·231	"	"	Genuine.....	24408	72	0	0
28·78	·420	·110	"	Much	Contains much glucose and is dyed.....	24925	73	65	60
17·24	·560	0·336	Salicylic acid	Doubtful	Contains much glucose and salicylic acid	25021	74	35	32

23925, 23934, 24405, 24925 and 25021. Of these samples, 20431, 23925, 23934 and 25021 contain salicylic acid; and 23290, 23925, 23934 and 24925 contain aniline dyes. No. 20429 is a genuine fruit jelly, but contains salicylic acid. This is quite unnecessary to the preservation of the article, which contains enough sugar for that purpose; and was probably added to the fruit, to give it keeping qualities, until it could be worked up into jelly.

The adulterated samples may be more definitely classified as follows :—

Containing glucose, preservatives and dyes, Nos. 23925, 23934.

Containing glucose and preservatives, Nos. 20431, 25021.

Containing glucose and dyes, Nos. 23290, 24,925.

Containing preservative, No. 20429

Containing glucose, No. 24405.

A. McGILL.

Erratum.

An error in calculation made the residual cane sugar readings too low by one half. This has been corrected in the present edition.

Addendum.

No attempt was made in the first edition of this bulletin, to determine the percentage amount of glucose present in jams and jellies. This was because no data existed upon which to base a definite opinion.

With a view to establishing such a basis for judgment, four (4) samples of glucose, such as is employed by jam manufacturers, have been subjected to analysis. These are :—

A. Four Star Brand, supplied by J. B. Perreault, Montreal.

B. Five Star Brand, supplied by The Lamoureau Co., Montreal.

C. Sample from Imperial Starch Co., Prescott, Ont.

D. Sample from Edwardsburg Starch Co., Cardinal, Ont.

The following table shews the results of work done on these samples :—

Sample.	Dry Solids.	Water.	Specific Gravity[1].	Polarization.[2]			Extraction of Dry Solids by Alcohol.[3]		Polarimeter reading of ppte by alcohol.[4]	Corresponding dextrin, p.c.[5]	Remarks.
				Direct.	Invert.	Difference.	Soluble.	Insoluble.			
A. ...	80·8	19·2	1·4856	+159°	+157°	—2°	71·5	9·3	+ 90°	7·8	
B	76·1	23·9	1·4546	+156°	+153°	—3°	62·8	13·3	+ 86°	7·4	
C .. .	80·0	20·0	1·4834	+176°	+175°	—1°	64·9	15·1	+170°	14·7	
D. ...	79·1	20·9	1·4749	+184°	+176°	—8°	52·3	26·8	+240°	20·8	Highest dextrin content.

(1) Determined by calculation from the gravity of a solution of 50 grammes to 100 cc.
(2) Calculated in Soleil-Ventzke sugar degrees, for a solution of 26,048 grammes of the sample in 100 cc.
(3) Alcohol of about 95 per cent strength.
(4) Calculated for a solution of the dextrin, from 100 grammes of the sample, dissolved to 100 cc. — and expressed in S.-V. sugar degrees.
(5) A solution of 26 grammes pure dextrin to 100 cc. reads nearly 300 S.-V. sugar degrees.

It will be seen that these samples vary in dextrin content from about 7 to nearly 21 per cent, so that a table of interpretation calculated for any given sample would give more or less erroneous results if applied to any other sample.

The following tables are constructed for the glucoses A and D, representing extremes of character.

A sample of commercial cane sugar dissolved 26,048 g. to 100 cc.—read at 20° C :—

Before inversion	+	98·8°
After inversion	−	30·6°
Total change	=	129·4° (Taken as 130°)

Glucose sample A, on a basis of dry matter, gave, on similar treatment :—

Before inversion	+	·199°
After inversion	+	196°
Total change	=	3°

Glucose sample D, gave :—

Before inversion	+	230°
After inversion	+	220°
Total change	=	10°

The formulas for construction of these tables are :—

TABLE—Cane sugar and glucose A—1·96b − ·3a
" " " D—2·2b − ·3a
a = percentage cane sugar.
b = percentage dry glucose.

CANE SUGAR AND GLUCOSE, SAMPLE A.

Cane Sugar.	Glucose A—Dry.	Glucose A—with 20% water.	Reading after inversion.	Remarks.
100	0	0	30°	Experimental numbers obtained by work on known mixtures, are in fairly close accordance with those derived by calculation.
90	10	12	7·4	
80	20	24	+ 15·2	
70	30	36	+ 37·8	
60	40	48	+ 60·4	
50	50	60	+ 83·0	
40	60	72	+105·6	
30	70	84	+128·2	
20	80	96	+150·8	
10	90	108	+173·4	
0	100	120	+196·0	

CANE SUGAR AND GLUCOSE, SAMPLE D.

Cane Sugar.	Glucose D—Anhydrous.	Glucose D—with 20% water.	Reading after inversion.	Remarks.
100	0	0	30°	See note above.
90	10	12	5°	
80	20	24	+ 20	
70	30	36	+ 45	
60	40	48	+ 70	
50	50	60	+ 95	
40	60	72	+120	
30	70	84	+145	
20	80	96	+170	
10	90	108	+195	
0	100	120	+220	

It will be noted by comparison of these tables, that an approximation to the amount of glucose originally present in the jam, can be made within five or ten per cent. The percentages given in the Analytical tables, do not profess to greater exactitude than this.

A. McGILL.

January 19, 1905.

APPENDIX K.

BULLETIN No. 97—FERTILIZERS, 1904.

OTTAWA, July 15, 1904.

W. J. GERALD, Esq.,
Deputy Minister of Inland Revenue.

SIR,—I submit herewith a tabulated statement, marked Table I., containing a description of 111 standard samples of agricultural fertilizers, which were sent in to the Department of Inland Revenue by their manufacturers, importers or vendors, in accordance with the provisions of the Fertilizers Act, 1890, and as representing the goods which it was proposed to offer for sale in Canada during the year 1904. The number of such samples is 111, and shows a diminution compared with the previous year when 128 were submitted.

Table I. gives the designations of the various brands of fertilizers, the names of the manufacturers or importers, the claims made as regards their contents in fertilizing ingredients, and the actual percentages of these found in the standard samples on analysis in this laboratory. The guaranteed contents are given in the upper line, and the analytical results in the second line placed opposite the designation of the fertilizer. In many cases the claims made are imperfect and indefinite, and in some, the requirements of the Act calling for a certificate of analysis, and a statement of the materials used in the manufacture of the fertilizer have been neglected. With regard to indefinite claims it may be stated that these are often made by manufacturers of repute, when, for instance, a particular sample is described as containing 'from 2·5 to 3·0 p.c. of ammonia,' or 'from 8 to 9 p.c. of available phosphoric acid,' or 'from 9·5 to 11 p.c. of potash.' In such instances if an ingredient is found deficient in the sample sold in the open market, and it is challenged, the manufacturer sometimes defends himself by maintaining that his guarantee does not extend above the lowest of the figures mentioned. For this reason the 'guaranteed contents' of a fertilizer, as stated in Table I, must be understood to indicate only the lowest percentage given on the manufacturer's label, or in his correspondence with the department.

As required by the Fertilizers Act, Table I also contains a column in which 'the relative value of each fertilizer calculated from the contents in fertilizing ingredients' is given, the prices of these ingredients being taken as follows :—

	Cents per lb.
Nitrogen in salts of ammonia or nitrates as well as in compound fertilizers	13
Organic nitrogen in ground bone, fish blood or tankage	12
Phosphoric acid :—	
Soluble in water	6
Soluble in 1 p.c. citric acid	$5\frac{1}{2}$
Insoluble in Thomas' Phosphate Powder	$3\frac{1}{2}$
Insoluble in ground rock phosphate and fertilizers generally	$1\frac{1}{2}$
Potash from high grade salts	$5\frac{1}{4}$

The valuation of each brand is calculated on the results of the analysis of the standard samples, but it has been omitted in the case of the guaranteed contents on account of the imperfect character of the information supplied in the majority of cases.

I have also to submit a description of the fertilizer samples which were collected, as sold in the open market, in accordance with your instructions of 14th January last. This description is called Table II, and contains the date of collecting the samples, the names of the vendors and manufacturers, the designation of the brands, and the results of the analysis. The figures obtained in examining the samples as sold are given on the same line which shows the name of the fertilizer. On the second line will be found the particulars of the manufacturers' guarantee, when the brand has been registered. On the third line is given the analysis of the corresponding standard sample, if it has been supplied to the department. In cases where no standard samples have been sent in to the department and nevertheless, in contravention of the Fertilizers Act, the fertilizers have been offered for sale, it has of course not been found possible to give either the guaranteed contents or the analysis of a standard sample. The number of such fertilizers not registered and therefore illegally sold amounts to 24, more than twice as many as in former years. It would appear to be necessary to take some action to suppress this selling of fertilizers, in regard to which the vendors have made no effort to comply with the law.

According to the opinions expressed by the district analysts 13 out of the 96 samples collected have been found to be adulterated according to the Act, being deficient in available phosphoric acid or other fertilizing constituent. Further action under the Act would also seem to be necessary in these cases.

In my report of May 13, 1901 (Bulletin No. 75), the proceedings were fully detailed which led to an alteration in the method of determining the available phosphoric acid in fertilizers, the adoption of which was then authorized by the Commissioner of Inland Revenue. This method has since been carried out in this laboratory, and in those of the district analysts, and has worked very satisfactorily. From its results it would appear that the solubility of the phosphoric acid in non-acidulated samples increases in the following order :—1, bonemeal ; 2, tankage ; 3, Thomas' Phosphate Powder or basic slag. The "citric soluble" phosphoric acid of our analysis corresponds pretty closely with the "reverted" claimed by United States manufacturers. Since they still continue to mention, in their guarantees, a percentage of "reverted" phosphoric acid, it seems necessary to state that in Canada, a determination of "citric soluble" phosphoric acid is substituted for that of "reverted." The details of the process adopted here for ascertaining the percentage of "available" phosphoric acid contained in agricultural fertilizers will be found in Bulletins 75 and 86.

I beg to recommend the publication of this report, together with Tables I and II as well as the memoranda on manures, which it has been customary to print at the end of the annual Fertilizer Bulletin.

I have the honour to be sir, your obedient servant,

THOMAS MACFARLANE,
Chief Analyst.

TABLE I.—Statement of the Results of Examining 111 Standard

Number of Sample.	Designation.	Name of Manufacturer.	By whom sent.	From what Materials Produced.	—
1492	Essex Complete Manure for Corn, Grain and Grass.	Russia Cement Co.	S. C. Shaffner, Granville Ferry, N.S.	Dry ground fish, ground fish bone, high grade muriate of potash, high grade sulphate of potash, nitrate of soda, dry ground blood, &c.	Guaranteed contents Standard sample....
1493	Essex Complete Manure for Potatoes, Roots and Vegetables.	" ..	" ..		Guaranteed contents Standard sample....
1494	Essex 'A 1' Superphosphate.	" ..	" ..	Superphosphate of lime.	Guaranteed contents Standard sample....
1495	Essex XXX Fish and Potash.	" ..	" ..	" ..	Guaranteed contents Standard sample....
1496	Essex Orchard Fertilizer.	" ..	" ..	" ..	Guaranteed contents Standard sample....
1497	Essex Fine Bone Meal.	" ..	" ..	" ..	Guaranteed contents Standard sample....
1498	Essex Market Garden and Potato.	" ..	" ..	" ..	Guaranteed contents Standard sample. ..
1499	Essex Dry Ground Fish.	" ..	" ..	" ..	Guaranteed contents Standard sample...
1500	Fertilizer.....	Laing Packing and Provision Co., Ltd., Montreal.	Manufacturers ...	Blood, offal and tankage from hogs and cattle.	Guaranteed contents Standard sample....
1501	Fertilizer 'A'.....	Harris Abattoir Co., Ltd.	Edward Adie, Sec'y Treas., Toronto.	Dried blood, bone and tankage.	Guaranteed contents Standard sample....
1502	Fertilizer 'A'.. ...	The Wm. Davis Co., Ltd., Toronto.	Manufacturers ...	" ..	Guaranteed contents Standard sample....
1503	Fertilizer 'C'.....	" ..	"	Tank water condensed and dried.	Guaranteed contents Standard sample....
1504	Reid's Superphosphate.	Thos. Reid, St. John, N.B.	"	....	Guaranteed contents Standard sample...
1505	No. 1 Brand..	Nichols Chemical Co. of Canada, Capelton, Que.	" ..	Canadian apatite dissolved with sulphuric acid, muriate of potash and sulphate of ammonia.	Guaranteed contents Standard sample....
1506	Reliance...	" ..	" ...	.. . .	Guaranteed contents Standard sample....
1507	Royal Canadian.....	Nichols Chemical Co. of Canada, Capelton, Que.	Manufacturers....	....	Guaranteed contents Standard sample.
1508	Victor...	" " ..	"		Guaranteed contents Standard sample....
1509	Crown..... ...	" " .	"		Guaranteed contents Standard sample....
1510	Capelton Brand. ..	" " ..	"		Guaranteed contents Standard sample....

Samples of Commercial Fertilizers, registered for 1904.

Results of Analysis.										
Nitrogen.		Phosphoric Acid.								
Total including Nitric Acid and Ammonia.	Total Calculated as Ammonia.	Soluble in Water.	Citric Soluble.	Insoluble.	Total.	Total Available.	Potash.	Moisture.	Relative Value per Ton of 2,000 lbs.	Name of Analyst and Number of Sample.
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	$ cts.	
3·30	4·00	3·00	4·00	2·50	9·50	.....	9·50	.....	.....	1492
3·15	3·82	6·20	3·08	1·92	11·20	9·28	9·92	11·05	29 99	J. G. A. Valin.
3·70	4·50	3·00	4·00	2·00	9·00	.....	8·50	.....	.....	1493
4·21	5·35	7·16	1·92	1·79	10·87	9·08	7·24	8·60	30 19	
.....	1·25	.....	.....	.....	9·00	7·00	2·00	.....	.....	1494
0·87	1·05	1·79	5·69	5·12	12·60	7·48	1·66	5·80	13 82	
.....	2·50	4·50	4·50	3·00	12·10	.....	2·50	.....	.....	1495
1·51	1·83	5·63	5·05	2·56	13·24	10·68	2·53	10·55	19 63	
.....	2·00	4·00	3·00	2·00	9·00	.....	8·50	.....	.....	1496
1·84	2·24	3·98	4·15	4·47	12·60	8·13	8·19	6·00	24 04	
.....	3·00	.....	24·00	.....	24·00	.....	.....	.....	.....	1497
2·24	2·72	.....	12.75	13·48	26·23	12·75	0·30	3·95	24 19	
2·00	2·40	4·00	4·00	2·00	10·00	.....	5·00	.....	.....	1498
2·10	2·55	4·47	7·23	0·77	12·47	11·70	3·99	8·80	23 14	
.....	8·00	.....	11·00	.....	11·00	.....	.....	8·00	.....	1499
8·47	10·28	.....	11·32	3·20	14·52	11·32	0·16	9·00	33 89	
6·23	7·56	.....	.....	.....	13·31	.....	.....	10·61	.....	1500
6·78	8·22	.....	10·88	2·39	13·27	10·88	.....	11·24	28 98	Miss E. Davidson.
9·13	11.08	.....	.....	.....	5·86	.....	.....	6·02	.....	1501
9·60	11·66	.....	4·64	1·43	6·07	4·64	.....	5·84	28 56	
6·93	8·42	.....	.....	.....	13·72	.....	.....	8·00	.....	1502
6·58	7·99	.....	14·40	1·59	15·99	14·40	.....	6·32	32 10	
12·83	15 58	.....	.....	.....	2·82	.....	.....	8·42	.....	1503
12·99	15·77	.....	2 71	0·32	3·03	2·71	1·25	8·40	35 56	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1504
3·02	3 66	3·16	2·22	5·36	10·74	5·38	2·28	27 46	18 07	
.....	.....	.....	.....	.....	.....	11·05	.....	.....	.....	1505
None...	None...	9·72	1·48	6·20	17·40	11·20	None.	11 85	15 14	A. Lemoine.
.....	2·00	.....	.....	.....	.....	6 00	2·00	.....	.....	1506
1·68	2 04	6·84	1·35	4·60	12·79	8 19	3·76	10·15	19 36	
.....	4·00	.....	.....	.....	.....	9·00	5.00	.....	.....	1507
2·80	3·40	7·16	1 48	3·96	12·60	8 64	6·68	9·40	25 68	A. Lemoine.
.....	2·00	.....	.....	.....	.....	7·00	3·00	.....	.....	1508
1·96	2·38	4·15	2·89	2·36	9·40	7·04	1 49	9·75	18 65	
.....	2·00	.....	.....	.....	.....	11·00	2·50	.....	.....	1509
2·87	3·48	11·00	0·65	2·87	14·52	11.65	3·68	11·90	26 09	
.....	.....	.....	.....	.....	.....	8·00	.....	.....	.....	1510
None.	None.	4·92	2 34	4·25	11·51	7·26	None.	10·40	9 74	

TABLE I.—Statement of the Results of Examining 111 Standard Samples

Number of Sample.	Designation.	Name of Manufacturer.	By whom sent.	From what Materiels Produced.	—
1511	Williams & Clarke American Potato Manure.	American Agricultural Chemical Co., Boston, Mass	Ross L. Coe, Local Treasurer, Boston.	Bone black, animal bone, phosphatic guano, dried fish meat or blood, nitrate of soda or sulphate of ammonia sulphate, or muriate of potash and sulphuric acid.	Guaranteed contents Standard sample....
1512	Pacific Potato Special.	"	"	....	Guaranteed contents Standard sample....
1513	Pacific Nobsque Guano.	"	"	.....	Guaranteed contents Standard sample....
1514	Pacific Fine Ground Bone.	"	"	.....	Guaranteed contents Standard sample....
1515	Soluble PacificGuano	"	"	.....	Guaranteed contents Standard sample ...
1516	Tucker's Imperial Bone Superphosphate.	"	"	.....	Guaranteed contents Standard sample ...
1517	Bradley's Eclipse Phosphate.	"	"	.....	Guaranteed contents Standard sample....
1518	Bradley's XL Superphosphate of Lime	"	"	.....	Guaranteed contents Standard sample....
1519	Bradley's Potato Fertilizer.	"	"	.....	Guaranteed contents Standard sample....
1520	Bradley's Farmers New Method Fertilizer.	"	"	.....	Guaranteed contents Standard sample....
1521	Bradley's Fine Ground Bone.	"	"	.....	Guaranteed contents Standard sample....
1522	Read's Standard Superphosphate.	"	"	.....	Guaranteed contents Standard sample ...
1523	Read's Practical Potato Special.	"	"	.....	Guaranteed contents Standard sample....
1524	Read's Sure Catch Fertilizer.	"	"	.....	Guaranteed contents Standard sample ...
1525	Quinnipiac Climax Phosphate for all crops.	"	"	.....	Guaranteed contents Standard sample....
1526	Cumberland Superphosphate.	"	"	.....	Guaranteed contents Standard sample....
1527	Cumberland Potato. Fertilizer.	"	"	.....	Guaranteed contents Standard sample....
1528	Cumberland Fine Ground Bone.	"	"	.....	Guaranteed contents Standard sample.
1529	Great Eastern High Grade Special Potato Manure.	American Agricultural Chemical Society.	Great Eastern Fertilizer Branch, Rutland, Vt.	.....	Guaranteed contents Standard sample....
1530	Great Eastern Northern Corn Special.	"	"	.....	Guaranteed contents Standard sample....
1531	Great Eastern Potato Manure.	"	"	.....	Guaranteed contents Standard sample....
1532	Great Eastern General Fertilizer.	"	"	.....	Guaranteed contents Standard sample....

of Commercial Fertilizers, registered for 1904—*Continued.*

Results of Analysis.										
Nitrogen.		Phosphoric Acid.					Potash.	Moisture.	Relative value per ton of 2,000 lbs	Name of Analyst and Number of Sample.
Total including that of Nitric Acid and Ammonia.	Total calculated as Ammonia.	Soluble in Water.	Citric Soluble.	Insoluble.	Total.	Total Available.				
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	$ cts.	
2·06	2·50	5·00	3·00	2·00	10·00	8·00	3·00	.....	.....	1511
1·89	2·29	6·72	2·37	1·79	10 88	9·09	2 16	13·10	18 36	J. G. A. Valm.
2·06	2·50	5 66	3·00	2 00	10 00	8 00	3 00	.....	.....	1512
1·90	2 31	6·20	2·75	2·05	11 00	8 95	2·16	13·45	18 27	
1·03	1 25	6 00	2·00	2 00	10 00	8 00	2 00	.....	.....	1513
1·05	1 27	6 08	3·01	1·79	10 88	9 09	1 74	9 80	15 68	
2 50	3·00	.....	.....	.....	21 00	.....	.....	.....	.....	1514
2 53	3 19	.....	12 79	6 72	19 51	12 79	.....	6·25	22 14	
2·06	2·50	5 00	3 00	2·00	10 00	8·00	1 50	.....	.....	1515
2·10	2 55	6 52	2·44	2·36	11 32	8 96	1·83	13·15	18 58	A. Lemoine.
1·03	1 25	6·00	2·00	2 00	10 00	8 00	2 00	.....	.....	1516
1 26	1 53	6·20	3·08	2·23	11 51	9 28	2 43	10·90	17 30	
1 93	1·25	6·00	2·00	2·00	10 00	8 00	2 00	.....	.....	1517
1·26	1·53	6 52	2 37	2 75	11 64	9 09	2 27	10·65	17 05	
2 06	2·50	5 00	3·00	2·00	10 00	8 00	1 50	.....	.....	1518
2·12	2·58	6·20	3·40	1·91	11 51	9·60	1 75	13·45	19 09	
2 06	2 50	5·00	3·00	2·00	10 00	8 00	3·00	.....	.....	1519
2·10	2·55	6·20	2·89	2·23	11 32	9 09	2 95	13·85	19 82	
1·03	1 25	6·00	2·00	2·00	10 00	8 00	2 00	.....	.....	1520
1·08	1 31	7 84	2 24	2·39	12 47	10 08	4·51	9·52	20 03	Miss E. Davidson.
2·50	3 00	.....	.....	.....	21 00	.....	.....	.....	.....	1521
2·91	3 53	.....	14 72	6·07	20 79	14·72	.....	5·80	24·99	
0·82	1·00	5·00	3 00	2·00	10 00	8·00	4·00	.....	.....	1522
1·07	1·30	7 19	3 85	2·07	13 11	11·04	5·90	9·00	22 44	Miss E. Davidson.
0·82	1·00	2·00	2·00	1·00	5 00	4·00	8·00	.....	.....	1523
1·03	1·25	3 04	2·72	1·28	7 04	5·76	8·70	9 16	18 81	
.....	.....	6·00	4·00	1·00	11 00	10·00	2 00	.....	.....	1524
0·56	0 68	10·36	1·60	2·11	14 07	11 96	2.35	7·45	18·73	J. G. A. Valin.
1 03	1 25	6·00	2·00	2·00	10 00	8·00	2·00	.....	.....	1525
0·98	1 19	7 04	1·72	2 56	11 32	8 76	0·80	9·55	14 47	
2·06	2·50	5·00	3·00	2·00	10 00	8·00	1·50	.....	.....	1526
1·96	2·38	6·40	3·64	2·11	12 15	10·04	1·79	12·10	19 27	
2·06	2 50	5·00	3·00	2·00	10 00	8·00	3 00	.....	.....	1527
2·52	3·06	6·85	2·55	2·11	11 51	9·40	2·14	13·40	20·44	
2·50	3·00	.....	.....	.....	21·00	.....	.....	.....	.....	1528
2 03	2·46	.....	13·30	6·72	20 02	13·30	.....	5 90	21 51	
3·30	4·00	4·00	2·00	1·00	7 00	6·00	10·00	.....	.....	1529
3·30	4·01	3·71	3·20	1 08	7 99	6·91	9·57	8·80	26 91	A. Lemoine.
2 06	2·50	5·00	3·00	1·00	10 00	8·00	1·50	.....	.....	1530
2·24	2 72	5·95	4·41	1 28	11 64	10 36	1·62	12·35	19 89	
2·06	2 50	5 00	3·00	1·00	10·00	8·00	3·00	.....	.....	1531
1·10	2 55	6·07	3 53	1·40	11·00	9·60	3·03	13 60	20 22	
0·82	1·00	5·00	3·00	1 00	10 00	8·00	4·00	.....	.....	1532
1·30	1·58	5·88	4 16	1·28	11 32	10·04	4·53	8·75	20·13	

TABLE I.—Statement of the results of Examining 111 Standard Samples

Number of Sample.	Designation.	Name of Manufacturer.	By whom sent.	From what Materials Produced.	——
1533	Great Eastern Grass and Oats Fertilizer.	American Agricultural Chemical Society.	Great Eastern Fertilizer Branch, Rutland, Vt.	. . . . .	Guaranteed contents Standard sample....
1534	Superphosphate of Lime.	Standard Fertilizer and Chemical Co., Smiths' Falls.	R. J. Brodie, Smiths' Falls.	Mineral Phosphate	Guaranteed contents Standard sample....
1535	Special Fertilizer ...	" " ..	" " ..	Nitrate of Soda Sulphate of Ammonia Potash and Magnesia Salts and Mineral Superphosphates.	Guaranteed contents Standard sample....
1536	Standard Fertilizer..	" " ..	" " ..	" " ..	Guaranteed contents Standard sample....
1537	Star Fertilizer.....	" " ..	" " ..	" " ..	Guaranteed contents Standard sample....
1538	No. 1 Fertilizer... .	" " ..	" " .	" " ..	Guaranteed contents Standard sample....
1539	Royal Fertilizer.....	" " ..	" " .	" " ..	Guaranteed contents Standard sample....
1540	Nitrate of Soda.....	" " ..	" " ..	. . . . .	Guaranteed contents Standard sample....
1541	Swift's Lowell Bone Fertilizer.	Lowell Fertilizer Co., Boston, Mass.	Benj. Moody, Agt.	Blood, meat, bone, bone black, bone phosphate.	Guaranteed contents Standard sample....
1542	Swift's Lowell Potato Manure	" " ..	" " .	Nitrate of soda, sulphate of ammonia.	Guaranteed contents Standard sample....
1543	Swift's Lowell Potato Phosphate.	" " ..	" " .	Sulphate or muriate of potash.	Guaranteed contents Standard sample ...
1544	Swift's Lowell Ground Bone.	" "	" " ..	. . . . .	Guaranteed contents Standard sample . .
1545	Swift's Lowell Animal Brand.	" " .	" " .	....	Guaranteed contents Standard sample....
1546	The New England Corn Phosphate.	The New England Fertilizer Co., Boston, Mass.	A. P. Clarke, Agt., Boston.	Blood, meat, bone, bone black, bone phosphate, nitrate of soda or sulphate of ammonia.	Guaranteed contents Standard sample....
1547	The New England Potato Fertilizer.	" " ..	" " ..	" " ..	Guaranteed contents Standard sample....
1548	The New England Corn and Grain Fertilizer.	" " ..	" " ..	Sulphate or muriate of potash.	Guaranteed contents Standard sample....
1549	Ingersoll Fertilizer "A."	Ingersoll Packing Co., Ingersoll, Ont.	C. S. Wilson, Manager, Ingersoll.	....	Guaranteed contents Standard sample....
1550	Freeman's Sure Growth Manure.	The W. A. Freeman Co., Ltd., Hamilton.	W. A. Freeman...	Phosphate, bone, blood, tankage, sulphuric acid.	Guaranteed contents Standard sample....
1551	Bone and Potash..	" " .	" " ..	Muriate of potash, sulphate of potash, sulphate of ammonia and nitrate of potash.	Guaranteed contents Standard sample....

of Commercial Fertilizers, registered for 1904—*Continued.*

Results of Analysis.										
Nitrogen.		Phosphoric Acid.					Potash.	Moisture.	Relative value per ton of 2,000 lbs	Name of Analyst and Number of Sample.
Total including Nitric Acid and Ammonia.	Total calculated as Ammonia.	Soluble in Water.	Citric Soluble.	Insoluble.	Total.	Total Available.				
p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	$ cts.	
.....	.....	6·00	5·00	1·00	12 00	11 00	2·00	.....	.....	1533
.....	.....	9·40	2·76	1·40	13·56	12·16	2·29	7·70	17 13	
.....	.....	.....	.....	.....	16 00	14·00	.....	.....	.....	1534
0·14	0·17	10·04	1·99	4·60	16·63	12 03	....	10·75	15·96	J. G. A. Valin.
.....	3 50	.....	.....	.....	10·00	8·00	6·00	.....	.....	1535
3 15	3 82	7·35	0·78	2·75	10·88	8 13	7·00	8 55	26·03	
.....	2·50	.....	.....	.....	11·00	9·00	2·00	.....	.....	1536
2·52	3·06	7·16	1·15	3·65	11·96	8 31	2·08	8 50	19 67	
.....	2·00	.....	.....	.....	6·00	5 00	2·00	.....	.....	1537
1·82	2 21	4·15	0·58	1·67	6 40	4·73	1·64	3·85	12 56	J. G. A. Valin.
.....	2·00	.....	.....	.....	11 60	9·00	1·25	.....	.....	1538
1 78	2·16	6 40	1·08	4 48	11·96	7 48	1·64	9 40	16 54	
.....	2·00	.....	.....	.....	9·00	8·00	3·00	.....	.....	1539
1 94	2·36	5·11	2 37	2·43	9 91	7·48	3·09	8 27	18 73	A. Lemoine.
.....	18·05	.....	.....	.....	.....	.....	.....	.....	.....	1540
14 92	18·12	.....	.....	.....	.....	.....	.....	2·35	38 79	
.....	2·00	.....	.....	.....	9·00	8·00	3 00	.....	.....	1541
1 75	2 17	3·34	5·45	0·80	9·59	8·79	3·05	10·35	18 08	
.....	2·00	.....	.....	.....	8·00	7·00	4·00	.....	.....	1542
1·79	2·17	4·79	1·92	0 96	7·67	6·71	5·04	10·90	17·17	
.....	3·00	.....	.....	.....	9·00	8·00	6·00	.....	.....	1543
2·73	3 31	4·03	4·28	1·15	9·46	8·31	6 08	8·65	23 34	
.....	3·00	.....	.....	.....	.....	.....	.....	.....	.....	1544
2 59	3·14	.....	14·07	12·79	26·86	14·07	....	3 16	25·51	Miss E. Davidson.
.....	3 00	.....	.....	.....	10·00	9 00	4·00	.....	.....	1545
2·28	2 79	8·15	2·57	1·75	12·47	10·72	4·13	11 08	23 37	
.....	2 00	.....	.....	.....	9·00	8·00	3·00	.....	.....	1546
2·75	3·34	5·27	4·17	1 43	10·87	9·44	3·43	9·08	22 07	
.....	2 00	.....	.....	.....	8 00	7·00	4·00	.....	.....	1547
1·93	2 34	5·91	1·92	0·96	8·79	7·83	5·50	10·72	20 26	
.....	1 50	.....	.....	.....	8·00	7·00	2·00	.....	.....	1548
1 02	1·24	6·71	0·81	0·95	8·47	7·52	1 79	10·20	13 44	
.....	9 00	.....	5·50	6·80	.....	.....	..	8·00	.....	1549
7·00	8·50	Trace...	9·31	0·60	9·91	9·31	..	12·50	27 22	A. Lemoine.
.....	3 50	.....	.....	.....	8·00	.....	3 00	.....	.....	1550
2·94	3 57	5 75	3·53	6 39	15·67	9·28	3·07	11·75	23·55	
.....	2 00	.....	.....	.....	9 00	.....	6 00	.....	.....	1551
2·24	2·72	6·07	3·21	5·11	14·39	9·28	6 95	9 70	25 45	

TABLE I.—Statement of the Results of Examining 111 Standard

Number of Sample.	Designation.	Name of Manufacturer.	By whom sent.	From what Materials Produced.	—
1552	Celery and Early Vegetable Manure.	The W. A. Freeman Co., Ltd., Hamilton.	W. A. Freeman.	Muriate of potash, sulphate of potash, sulphate of ammonia and nitrate of potash.	Guaranteed contents. Standard sample....
1553	Phosphate Powder.	"	"	"	Guaranteed contents. Standard sample....
1554	Freeman's Potato Manure.	"	"	"	Guaranteed contents. Standard sample....
1555	Freeman's Tankage Manure.	"	"	"	Guaranteed contents. Standard sample....
1556	Freeman's Tobacco Manure.	"	"	"	Guaranteed contents. Standard sample....
1557	Freeman's Pure Bone Meal.	"	"	"	Guaranteed contents. Standard sample
1558	Brand H Fertilizer..	W. Harris & Co., Toronto.	Manufacturers....	Blood, Flesh and Bone.	Guaranteed contents. Standard sample...
1559	Bone Meal..	"	"	Crude Bone.....	Guaranteed contents. Standard sample....
1560	Potato Phosphate...	Provincial Chemical Fertilizer Co., St. John, N.B.			Guaranteed contents. Standard sample....
1561	Imperial Superphosphate	"	"		Guaranteed contents. Standard sample....
1562	Victor Guano	"	"		Guaranteed contents. Standard sample ...
1563	Bone Meal...	"	"		Guaranteed contents. Standard sample....
1564	Bone, Blood and Potash.	"	"	"	Guaranteed contents. Standard sample....
1565	Potato Phosphate...	The Nova Scotia Fertilizer Co., Halifax, N.S.	C. M. Jack, Mn'g'r		Guaranteed contents. Standard sample....
1566	Ceres Superphosphate.	"	"		Guaranteed contents. Standard sample....
1567	Bone Meal.....	"	"		Guaranteed contents Standard sample....
1568	Fruit Tree Fertilizer	"			Guaranteed contents Standard sample....
1569	Blood, Bone and Potash.				Guarenteed contents Standard sample....
1570	High Grade Southern Guano.				Guaranteed contents Standard sample....
1571	Bone and Potash....	"			Guaranteed contents Standard sample....
1572	Bradleys New Method Fertilizer.	American Agricultural Chemical Co., Boston.	Buffalo Sales Dept., Buffalo.		Guaranteed contents Standard sample...
1573	Bradleys B. D. Sea Fowl Guano.	"	"	"	Guaranteed contents Standard sample....
1574	Bradleys Complete Manure for Potatos and Vegetables.				Guaranteed contents Standard sample....
1575	Crokers Wheat and Corn Fertilizer.				Guaranteed contents Standard sample....

SESSIONAL PAPER No. 14

Samples of Commercial Fertilizers, registered for 1904—*Continued.*

Results of Analysis.										
Nitrogen.	Phosphoric Acid.								Relative value per ton of 2,000 lbs	Name of Analyst and Number of Sample.
Total including Nitric Acid and Ammonia.	Total calculated as Ammonia.	Soluble in Water.	Citric Soluble.	Insoluble.	Total.	Total Available.	Potash.	Moisture.		
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	$ cts.	
..	6·00	.....	.....	.....	9·00	.....	6·00	...	..	1552
5·29	6·42	4·99	3·52	3·83	12·34	8·51	7·64	8·80	32·76	A. Lemoine.
.....	.....	.....	.....	.....	15·00	.....	.....	.....	.....	1553
.....	.....	9·59	4·29	4·03	17·91	13·88	.....	6·65	17·41	
.....	3·00	.....	.....	.....	8·00	.....	5·00	.....	.....	1554
2·64	3·21	6·23	2·08	5·28	13·59	8·31	5·79	10·20	24·26	Miss E. Davidson.
.....	5·00	.....	.....	.....	12·00	.....	.....	.....	.....	1555
5·67	6·88	0·00	12·16	3·83	15·99	12·16	.....	9·84	28·11	
.....	6·00	.....	.....	.....	7·00	.....	7·00	.....	.....	1556
7·30	6·44	5·11	3·05	3·99	12·15	8·16	6·89	7·20	31·68	
.....	3·00	.....	.....	.....	23·00	.....	.....	.....	.....	1557
3·43	4·16	.....	15·51	9·75	25·26	15·51	.....	3·95	28·21	
.....	9·32	.....	.....	.....	7·16	.....	.....	.....	.....	1558
6·86	8·33	.....	5·12	2·87	7·99	5·12	1·15	9·52	25·52	
.....	5·41	.....	.....	.....	20·15	.....	.....	.....	.....	1559
4·66	5·66	.....	14·40	5·27	19·67	14·40	.....	3·12	28·60	
.....	2·50	.....	.....	.....	.....	8·00	6·50	.....	.....	1560
2·38	2·89	7·80	1·97	3·98	13·75	9·77	5·33	7·10	24·48	J. G. A. Valin.
.....	3·00	.....	.....	.....	.....	10·50	1·50	.....	.....	1561
2·52	3·06	7·22	4·70	5·95	17·87	11·92	1·35	8·60	23·57	
.....	2·00	.....	.....	.....	.....	7·00	2·50	.....	.....	1562
2·00	2·43	7·04	3·70	6·53	17·27	10·74	1·54	8·20	21·27	
.....	3·10	.....	.....	.....	24·14	.....	.....	.....	.....	1563
2·12	2·58	.....	15·48	5·76	21·24	15·48	.....	8·85	24·25	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1564
2·17	2·63	7·16	4·16	6·08	17·40	11·32	1·46	9·70	25·30	
.....	3·75	.....	.....	.....	.....	10·00	6·00	.....	.....	1565
3·24	3·94	10·55	0·65	1·59	12·79	11.20	7·70	11·55	30·34	A. Lemoine.
.....	2·08	.....	.....	.....	.....	.....	2·41	.....	.....	1566
2·80	3·40	9·78	1·28	1·28	12·34	11·06	7·04	13·50	28·18	
.....	3·00	.....	.....	.....	.....	.....	.....	.....	.....	1567
3·94	4·79	.....	9·60	12·47	22·07	9·60	.....	6·75	23·75	A. Lemoine.
.....	3·00	.....	.....	.....	.....	8·00	6·00	.....	.....	1568
3·99	4·84	11·38	0·26	0·83	12·47	11·64	6·46	10·95	31·32	
.....	2·00	.....	.....	.....	.....	7·00	4·00	.....	.....	1569
3·43	4·16	0·40	8·75	6·07	15.22	9·15	4·01	8·00	25·04	
.....	2·00	.....	.....	.....	.....	7·00	2·50	.....	.....	1570
3·50	4·25	8·96	0·50	1·73	11·19	9·46	4·11	10·25	25·22	J. G. A. Valin.
.....	2·00	.....	.....	.....	11·00	.....	2·00	.....	.....	1571
3·50	4·25	0·49	7·49	6·09	14·07	7·98	2·78	5·04	22·64	
0·82	1·00	6·00	2·00	1·00	9·00	8·00	2·00	.....	.....	1572
0·91	1·10	6·85	0·69	3·65	11·19	7·54	3·34	11·30	15·92	
2·06	2.50	6·00	2·00	1·00	9·00	8·00	1·50	.....	.....	1573
2·10	2·55	6·85	1·01	3·33	11·19	7·86	1·52	9·80	17·37	
3·29	4·00	6·00	2·00	1·00	9·00	8·00	7·00	.....	.....	1574
3·36	4·08	6·09	2·74	3·00	11·83	8·83	7·33	8·75	27·72	
2·06	2·50	6·00	2·00	1·00	9·00	8·00	1·50	.....	.....	1575
2·10	2·55	6·21	1·79	3·00	11·00	8·00	1·50	10·30	17·34	

TABLE I.—Statement of the results of examining 111 Standard Samples

Number of Sample.	Designation.	Name of Manufacturer.	By whom sent.	From what Materials Produced.	
1576	Crokers Cabbage Potato Manure.	American Agricultural Chemical Co., Boston.	Buffalo Sales Dept., Buffalo.	. . . . .	Guaranteed contents Standard sample. . .
1577	Crokers Harvest Jewel Fertilizer.	" " . .	" " . .	. . . . .	Guaranteed contents Standard sample. . . .
1578	Crokers Ammoniated Bone Superphosphate.	" " . .	" " . .	. . . . .	Guaranteed contents Standard sample. . . .
1579	Eureka	Pidgeon Fertilizer Co., Ltd., Windsor, U.S.	Robt. Pidgeon Manager.	Bone, Rock Phosphate, Animal Matter, Potash, Nitrate of Soda and Sulphuric Acid.	Guaranteed contents Standard sample. . .
1580	Intense Brand . . .	" "	" "	" "	Guaranteed contents Standard sample. . . .
1581	Potato Manure	" "	" "	" "	Guaranteed contents Standard sample. . .
1582	Ground Bone	" " . .	" " . .	. . . . .	Guaranteed contents Standard sample . . .
1583	Thomas' Phosphate Powder.	Chemical Works, late H. & E. Albert, Biebrich on Rhine.	The Anglo Canadian Chem. Co., St. John, N.B.	. . . . .	Guaranteed contents Standard sample. . . .
1584	Albert's Concentrated Soluble Horticultural Manure, Brand A. G.	" " . .	" " . .	. . . . .	Guaranteed contents Standard sample . . .
1585	Fertilizer "A"	Victoria Chemical Co., Ltd., Victoria, B.C.	John A. Hall, Treasurer, Victoria.	Nitrate of soda, muriate of potash and superphosphate of lime	Guaranteed contents Standard sample. . .
1586	Fertilizer "B"	" " . .	" " . .	" " . .	Guaranteed contents Standard sample. . . .
1587	Fertilizer "C"	" " . .	" " . .	Muriate of potash and superphosphate of lime.	Guaranteed contents Standard sample. . . .
1588	Superphosphate of Lime.	" " . .	" " . .	Treating bone char with sulphuric acid.	Guaranteed contents Standard sample. . . .
1589	Nitrate of Soda	" " . .	" " . .	. . . . .	Guaranteed contents Standard sample. . . .
1590	Kainite.	" " . .	" " . .	. . . . .	Guaranteed contents Standard sample. . . .
1591	Sulphate of Potash. .	" "	" "	. . . . .	Guaranteed contents Standard sample . . .
1592	Muriate of Potash. .	" " . .	" " . .	. . . . .	Guaranteed contents Standard sample. . . .
1593	Thomas' Phosphate Powder.	" "	" "	. . . . .	Guaranteed contents Standard sample. . . .

of Commercial Fertilizers, registered for 1904—*Continued.*

Results of Analysis.										
Nitrogen.		Phosphoric Acid.					Potash.	Moisture.	Relative value per ton of 2,000 lbs	Name of Analyst and Number of Sample.
Total including Nitric Acid and Ammonia.	Total calculated as Ammonia.	Soluble in Water.	Citric Soluble.	Insoluble.	Total.	Total Available.				
p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	$ cts.	
2·47	3·00	6·00	2·00	1·00	9·00	8·00	6·00			1576
2 63	3·19	6 55	1·61	2·87	11·03	8·16	5·98	12·20	23·59	Miss. E. Davidson.
1·65	2·00	6·00	2·00	1·00	9 00	8 00	2·00			1577
1 82	2·21	6·23	2·57	2·55	11·35	8·80	2·58	10·40	18 48	
2 47	3·00	6·00	3·00	2·00	11·00	9·00	2·00			1578
2 67	3·24	6·71	2·57	2·87	12·15	9·28	2·89	13 66	21 70	
	2 50				8·00		1·50			1579
1 90	2·31	6·55	1·83	1·91	10·29	8·38	2 54	14·84	18 04	
	3·50				7 00		4 50			1580
2·52	3 06	5 59	1 77	2·39	9 75	7 36	5·01	13·20	21 16	
	3 00				8 00		4 00			1581
2 59	3 14	6·27	2 23	0 96	9 46	8·50	4·05	14·10	21 23	A. Lemoine.
	3·00				20 00					1582
3 78	4·59		11 84	11·51	23 35	11 84		2·50	25 54	
					18·00					1583
			16·64	2·87	19 51	16·64		0 15	20 30	
12·32		11 30					19·71			1584
12·32	14 96	11 70	0·45		12·15	12·15	19·92	1·90	66 98	
4·00					10 00		7 00			1585
3·78	4·59	11·51	1·15	Trace.	12·66	12·66	7 04	11·80	32 28	
3·50					9·00		11·00			1586
3·57	4·33	10·74	0·77	Trace.	11·51	11·51	10·75	12·00	34 28	
					12·50		11·00			1587
Trace.		13·30	1·60	Trace.	14·90	14·90	10·75	11·95	29 00	
					16·00					1588
		17·59	0·19	Trace.	17·78	17·78		11 20	21 30	
16·00										1589
15·26	18·52							3 00	39 67	
							12·00			1590
							11·99	11 95	12 58	
							50·00			1591
							47·16	2·30	49 51	
							50·00			1592
							46·64	5 45	19 30	
					15·00					1593
			13·24	5·95	19·19	13·24		0·25	18·72	

TABLE I.—Statement of the Results of Examining 111 Standard

Number of Sample.	Designation.	Name of Manufacturer.	By whom sent.	From what Materials Produced.	——
1594	Homestead Bone Black Fertilizer.	Michigan Carbon Works, Detroit, Mich.	Wm. H. Burtenshaw, Secretary-Treas., Detroit.	.....	Guaranteed contents Standard sample ...
1595	Homestead Potato and Tobacco Fertilizer.	" "	" "	.....	Guaranteed contents Standard sample....
1596	Dessicated Bone....	" "	" "	.....	Guaranteed contents Standard sample....
1597	Pure Animal Bone and Potash.	" "	" "	.....	Guaranteed contents Standard sample....
1598	Gregory's Special Tobacco Quanc.	" "	" "	.....	Guaranteed contents Standard sample....
1599	Burris' Fertilizer....	F. D. Burris, near Truro, N.S.	Manufacturer ...	Potash, nitrate of soda, dissolved bone, using plaster and black mud for a face.	Guaranteed contents Standard sample....
1600	Pure Ground Bone..	" "	" "	.....	Guaranteed contents Standard sample....
1601	Genuine Peruvian Guano.	Rufus R. Gage, Importer, Hamilton, Ont.	R. R. Gage.....	Seabird excreta, etc.	Guaranteed contents Standard sample....
1602	Fertilizer.....	Joseph O'Hara, Palmerston, Ont.	Manufacturer ...	Slaughter house refuse and by-products.	Guaranteed contents Standard sample....

Samples of Commercial Fertilizers, registered for 1904—*Concluded.*

RESULTS OF ANALYSIS.

Nitrogen.		Phosphoric Acid.					Potash.	Moisture.	Relative value per ton of 2,000 lbs	Number of Sample.
Total including Nitric Acid and Ammonia.	Total calculated as Ammonia.	Soluble in Water.	Citric Soluble.	Insoluble.	Total.	Total Available.				
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	$ cts.	
2·06	2·50				9·00	8·00	1·50			1594
3·45	2·97	6·71	1·60	2·43	10·74	8·31	1·60	11·80	18·58	A. Lemoine.
2·06	2·50				9·00	8·00	3·00			1595
2·26	2·75	5·63	2·05	1·59	9·27	7·68	4·40	12·50	19·96	
	1·50				25·00					1596
1·40	1·70		7·36	15·03	22·39	7·36		3·15	15·95	
0·82	1·00				22·00		10·00			1597
0·98	1·19	Trace.	11·33	12·02	23·35	11·33	8·90	2·75	27·97	
	3·00					8·00	4·00			1598
3·01	3·65	11·06	0·33	1·91	13·30	11·39	4·57	15·60	26·81	
										1599
2·12	2·58	Trace.	2·43	None.	2·43	2·43	6·70	16·40	15·21	
										1600
4·45	5·40	None.	7·87	14·07	21·94	7·87	Trace.	8·90	23·55	
	2·75				21·00		2·40			1601
2·03	2·46	1·91	12·16	4·67	18·74	14·07	3·74	18·80	26·35	
										1602
7·56	9·18	Trace.	7·68	1·59	9·27	7·68	Trace.	10·80	28·76	

TABLE II.—Results of the Examination of 96

Date of Collection.	Name of Sample or Brand.	No. of Sample.	Result of Analysis.						
			Nitrogen.		Phosphoric Acid.				
			Total in all states.	Total stated as Ammonia.	Soluble in Water.	Citric Soluble.	Insoluble.	Total.	Available.
1904.	*District of Nova Scotia.*		p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.
April 12	Potato Phosphate, as sold..	20446	2·35	2·86	7·21	0·69	1·95	9·85	7·90
	As guaranteed.....		.....	3·00	.....	.....	.....	8 00	.....
	Standard sample (1581)..	....	2·59	3·14	6·27	2·23	0·96	9·46	8·50
" 15	Essex Fish and Potash Fertilizer, as sold.	20451	3·19	3 83	2·18	7·49	3·52	13·19	9·67
	As guaranteed.....		.....	2·50	4·50	4·50	3·00	12 00	.....
	Standard sample (1495)..	....	1·51	1·83	5·63	5 05	2·56	13·24	10·68
" 15	EssexOrchard Brand,as sold	20452	1·60	1·94	1·39	6·16	5·10	12·60	7·75
	As guaranteed.....		.....	2·00	4·00	3·00	2·00	9·00	.....
	Standard sample (1496)..	....	1·84	2·24	3·98	4·15	4·47	12·60	8·13
" 15	Essex Potato and Market Garden, as sold.	20453	2·38	2 89	3·02	5·87	2·99	11·88	8·89
	As guaranteed.....	...	2·00	2 40	4 00	4·00	2·00	10·00	.....
	Standard sample (1498)..	....	2·10	2·55	4·47	7·23	0 77	12·47	11·70
" 15	Bradley's Bone, as sold....	20457	2 72	3 30	0 50	11·10	9·28	20·85	11·60
	As guaranteed.....	....	2·50	3 00	.....	.....	.....	21·00	.....
	Standard sample (1521)..	.....	2·91	3·53	.....	14·72	6·07	20·79	14·72
" 15	Bradley's Potato Fertilizer, as sold.	20458	2·18	2 65	5·47	3 29	2·48	11·24	8·76
	As guaranteed.....	....	2·06	2·50	5·00	3·00	2·00	10·00	8·00
	Standard sample (1519)..	....	2·10	2·55	6·20	2·89	2·23	11·32	9·09
" 15	Cumberland Ground Bone, as sold.	20459	2·30	2·79	Trace.	15·57	6·40	21·97	15·57
	As guaranteed	....	2 50	3·00	.....	.....	.....	21·00	.....
	Standard sample (1528)..	....	2·03	2·46	.....	13·30	6·72	20·02	13·30
" 16	Stockbridge Potato Manure as sold.	20460	3·56	4·32	3·98	1·85	1·60	7·43	5·83
" 16	Potato and Vegetables Phosphate, as sold.	20461	2·07	2·52	7·30	2·24	1·59	11 13	9·54
" 16	Swift Potato Manure, as sold.	20462	1·54	1·87	4·01	3·37	1·09	8·47	7·38
	As guaranteed.....	....	.....	2·00	.....	.....	.....	8·00	7·00
	Standard sample (1542)..	.....	1 79	2·17	4 79	1·92	0·96	7·67	6·71
	District of Nova Scotia.								
April 20	Ground bone as sold.....	20468	2·74	3·33	0·52	12·36	6·31	19·19	12·88
	As guaranteed	....	2·50	3·00	.....	.....	.....	21 00	.....
	Standard sample (1514)..	....	2·53	3·19	.....	12·79	6·72	19·51	12·79
" 20	Pacific Guano Fertilizer as sold.	20469	2·16	2·62	6·12	3·46	1·77	11·35	9·58
	As guaranteed	....	2·06	2·50	5·00	3·00	2·00	10·00	8·00
	Standard sample.....	....	2·10	2·55	6·52	2·43	2·36	11·32	8·96
	District of P.E. Island.								
" 29	Swift Lowell Animal Brand as sold.	24411	2·13	2·58	5·64	2·86	1·32	9·82	8·50
	As guaranteed	....	.....	3·00	.....	.....	.....	10·00	9·00
	Standard sample (1545)..	....	2·28	2·79	8·15	2·57	1·75	12·47	10·72
" 29	Bowkers Potato and Veg. Phosphate as sold.	24412	1·90	2·31	7·85	2·45	1·61	11·91	10·20

SESSIONAL PAPER No. 14

Samples of Fertilizers as sold in 1904.

Potash.	Moisture.	Relative value per ton of 2,000 lbs	Manufacturer or Furnisher as given by Vendor.	Name and Address of Vendor.		Name and Observations on Analysis.
p. c.	p. c.	$ cts.				
Undet.	11·82	20·29	Pidgeon Fertilizer Co., Windsor, N.S.	M. Hebb, Bridgewater, N.S.	20446	Unadulterated; M. Bowman.
4·00						
4·05	14·10	21·23				
Undet.	8·98	22·80	Russia Cement Co., Gloucester, Mass	S. C. Shaffner, Kentville, N.S.	20451	
2·50						
2·53	10·55	19·63				
Undet.	6·54	23·04	"	"	20452	
8·50						
8·19	6·00	24·04				
Undet.	11·92	22·39	"	"	20453	
5·00						
3·99	8·80	23·14				
Undet.	4·87	22·11	Bradley, Boston, Mass.	J. B. Chute, Berwick, N.S.	20457	
	5·80	24·99				
Undet.	14·44	19·72	"	"	20458	
3·00						
2·95	13·85	19·82				
	9·88	24·56	American Agricultural Chemical Co., Boston, Mass.	John N. Chute, Berwick.	20459	
	5·90	21·51				
Undet.	11·33	16·53	Bowker, Boston, Mass.	Wolfville Coal Co., Wolfville, N.S.	20460	Not registered "
Undet.	15·11	17·07	"	"	20461	"
Undet.	4·94	17·03	Lowell Fertilizer Co. Lowell, Mass.	R. E. Harris, N.S.	20462	Unadulterated
4·00						
5·04	10·90	17·17				
Undetermined.	7·60	22·67	Pacific Guano Co. Boston Mass.	E. M. Walker, Dartmouth, N.S.	20468	
	6·25	22·14				
Undet.	18·28	18·85			20469	
1·50						
1·83	13·15	18·58				
Undet.	10·12	20·02	Swift Lowell Co. Mass.	A. Horne & Co., Charlottetown.	24411	
4·60						
4·13	11·08	23·37				
Undet.	15·60	17·53	Bowker Fertilizer Co. Boston.	A. Pickard & Co., Charlottetown.	24412	Not registered

TABLE II.—Results of the examination of 96

Date of Collection.	Name of Sample or Brand.	No. of Sample.	Result of Analysis.						
			Nitrogen.		Phosphoric Acid.				
			Total in all states.	Total stated as Ammonia.	Soluble in Water.	Citric soluble.	In soluble.	Total.	Available.
1904.	*Distrit of P.E. Island*-Con.		p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.
May 2	Blood Bone and Potash as sold.	24413	2·18	2·65	.....	7·10	2·91	10·01	7·10
	As guaranteed	..	.....	2·00	.....	.....	.....	.....	7·00
	Standard sample (1569)..	.....	3·43	4·16	0·40	8 75	6·07	15·22	9·15
.. 3	Albert Thomas Phosphate Powder.	24414	.....	.....	.....	11·98	6·10	18·11	11·98
	As guaranteed	...	.....	.....	.....	.....	.....	18·00	.....
	Standard sample (1583)..	.....	.....	.....	.....	16·64	2·87	19·51	16·64
. 3	Kainit	24415	.....	.....	.....	.....	.....	.....	.....
	New Brunswick District.								
April 6	Reid's Superphosphate as sold.	23823	2·88	3·50	1·80	4·20	4·97	10·97	6·00
	Standard sample (1504)..	.....	3·02	3·66	3·16	2·22	5·36	10·74	5·38
.. 12	Standard Grade for Grain and Vegetables as sold.	23828	1·71	2·07	7·09	2·59	1·65	11·33	9·68
.. 13	Brand "XL" as sold. ..	23831	2·24	2 72	5·81	3·27	1·79	10 87	9·08
	As guaranteed..	.....	2·06	2·50	5·00	3·00	2·00	10·00	8·00
	Standard sample (1518)..	.....	2·12	2·58	6·20	3·40	1·91	11·51	9·60
.. 16	Read's Practical Potato special as sold.	23834	1·12	1·36	1·77	2·68	1·10	5·55	4·45
	As guaranteed	.....	0·82	1·00	2·00	2·00	1·00	5·00	4·00
	Standard sample (1523)..	.....	1·03	1·25	3·04	2·72	1·28	7·04	5·76
.. 16	Bowker's Potato and Vegetables Phosphate as sold.	23835	1 65	2·01	5·08	3·54	1·66	10·28	8·62
.. 18	Great Eastern General Fertilizer as sold.	23836	1·26	1·53	3·49	4·78	1·84	10·11	8·27
	As guaranteed.....	.....	0·82	1·00	5·00	3·00	1·00	10·00	8·00
	Standard sample (1532)..	.....	1·30	1·58	5 88	4·16	1·28	11 32	10·04
.. 29	Brand "Imperial" as sold.	23853	1·46	1·77	4·40	4·71	6·31	14·71	9·11
	As guaranteed.....	..	.....	3·00	.....	.....	.....	.....	10·50
	Standard sample (1561)..	.....	2·52	3·06	7·22	4·70	5·95	17·87	11·92
.. 29	Special Potato Phosphate as sold.	23854	1·18	1·43	2·33	4·05	7·66	14·04	7·35
	As guaranteed	.....	.....	2·50	.....	.....	.....	.....	8·00
	Standard sample (1560)..	.....	2·38	2 89	7·80	1·97	3·98	13·75	9·77
.. 30	Lowell Animal Brand as sold.	23855	2·44	2·96	5 36	2·71	1·66	9·73	8·07
	As guaranteed.....	.....	.....	3·00	.....	.....	.....	10·00	9·00
	Standard sample (1545)..	.....	2·28	2·79	8·15	2·57	1·75	12·47	10·72
	District of Quebec.								
.. 5	Vegetable and Potato Phosphate, as sold.....	24601	1·75	2·12	4·78	2·82	2·95	10·55	7·60
.. 5	Bone Phosphate, as sold...	24602	0·98	1·19	4 98	3·52	1·39	9·89	8·50
.. 6	" " ...	24603	1·40	1·70	5·60	2·66	2·78	11·04	8·26
.. 6	Bowker's Potato Fertilizer (6 per cent) as sold....	24604	1·15	1·40	6·00	1·95	2·27	10·22	7·95

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Samples of Fertilizers as sold in 1904—*Continued.*

Potash.	Moisture.	Relative value per ton of 2,000 lbs.	Manufacturer or Furnisher as given by Vendor.	Name and Address of Vendor.	No. of Sample.	Name and Occupation of Analyst.
p. c.	p. c.	$ cts.				
Undet.	7·34	18·54	Nova Scotia Fertilizer Co., Halifax, N.S.	A. E. Mutch & Co., Charlottetown.	24413	Unadulterated; M. Bowman.
4·00	.....	.....				
4·01	8·00	25·04				
.....	trace.	17·44	Wallace & Fraser, St. John, N.B....	K. T. Holman, Summerside, P.E.I.	24414	
.....	.....	.....				
.....	0.15	20·30				
Undet.	17·71	.....		Brace & McKay, Summerside.	24415	Not registered
Undet.	25·62	15 75	Thomas Reid, Parish of Simonds, St. John Co., N.B.	Thomas Reid, Parish of Simonds, St. John Co., N.B.	23823	Unadulterated, M. Bowman.
2·28	27·46	18·07				
Undet.	12·38	16 27	E. Frank Co., New York, U.S.A.	S. B. Hunter, Harvey Station, York County, N.B.	23828	Not registered
Undet.	13·62	18·38	Bradley Fertilizer Co., Boston, Mass., U.S.A.	Henry E. Hill & Co., King Street, St. Stephen, Charlotte Co., N.B.	23831	Unadulterated
1·50	.....	.....				
1·75	13·45	19·09				
Undet.	10·52	16·70	The American Agricultural Chemical Co., New York, U.S.A.	J. F. Theriault, Grand Falls, Victoria Co., N.B.	23834	
8·00	.....	.....				
8·70	9·16	18·81				
Undet.	14·57	14·76	Bowker Fertilizer Co., Boston and New York, U.S.A.	A. R. Hallett, Grand Falls, Victoria Co., N.B.	23835	Not registered
Undet.	11·16	17 45	The American Agricultural Chemical Co., New York, U.S.A.	Solomen Perley, Woodstock, Carleton Co., B.C.	23836	Unadulterated
4·00	.....	.....				
4·53	8 75	20·13				
Undet.	13·06	17·71	Provincial Chemical Fertilizer Co., Ltd., St. John, N.B.	Summer Co., Moncton, Westmoreland Co., N.B.	23853	Adulterated, being deficient in ammonia and phosphoric acid, M. Bowman.
1·50	.....	.....				
1·35	8·60	23·57				
Undet.	19·51	19·41			23854	Adulterated, being deficient in ammonia, M. Bowman.
6·50	.....	.....				
5·33	7·10	24·48				
Undet.	11 94	20·44	Swift Lowell Fertilizer Co., Boston, Mass., U.S.A.	Charles Elliot, Moncton, Westmoreland Co., N.B.	23855	Unadulterated
4·00	.....	.....				
4·13	11·08	28·38				
1·90	11·08	15 35	Bowker Fertilizer Co., Boston.	John Leith, Rectory Hill, Megantic ...	24601	Dr. J. T. Donald, not registered.
2·27	10·54	14 37	"	"	24602	"
1·86	15·58	16 06	"	E. Hebert, Tingwick, Athabaska Co.....	24603	"
4·45	14·87	17 68	"	J. McMurray, Windsor Mills, P.Q.	24604	

TABLE II.—Results of the Examination of 96 Samples

Date of Collection.	Name of Sample or Brand.	No. of Sample.	Result of Analysis. Nitrogen. Total, in all states.	Nitrogen. Total stated as Ammonia.	Phosphoric Acid. Soluble in Water.	Phosphoric Acid. Citric Soluble.	Phosphoric Acid. Insoluble.	Phosphoric Acid. Total.	Phosphoric Acid. Available.
1904.	*District of Quebec*—Con.		p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.
April 7	Bowker's Potato Fertilizer (6 per cent) as sold.	24605	1·15	1·40	4·51	2·91	2·07	9·49	7·42
" 7	Superphosphate with Potash, as sold.....	24606	0·17	0 21	7·67	3·06	2·80	13·13	10·73
" 7	Bone Phosphate, as sold...	24607	1·19	1·44	4·40	3·15	2·56	10·11	7·55
" 7	Square Brand, Bone and Potash, as sold.....	24608	1·54	1·87	4·84	2·39	2.35	9·58	7·23
" 7	Bone Phosphate, as sold...	24609	1·68	1 31	6.58	1·93	1·57	10·08	8·51
April 7	Superphosphate with Potash.	24610	0 21	0 25	7·60	2·33	2·70	12·63	9·93
" 8	Victor Fertilizer as sold..	24611	3 01	3 65	2·68	1·33	4·68	8·69	4·01
	As guaranteed.....			2·00					7·00
	Standard Sample (1508)..		1·96	2·38	4·15	2 89	2·36	9·40	7·04
" 8	Bowkers Vermont Fertilizer as sold.	24612	1·75	2·13	6·65	2·70	2 03	11·38	9·35
" 15	Victor complete Fertilizer as sold.	24613	2·48	3·01	2·81	0·81	5·20	8·82	3·62
	As guaranteed.....			2·00					7·00
	Standard Sample..		1·96	2·38	4·15	2·89	2·36	9·40	7·04
" 16	Celeryand Early Vegetable Manure as sold.	24614	2·94	3·57	5·72	4·16	4·40	14·28	9·88
	As guaranteed.....			6·00				9·00	
	Standard Sample (1552)..		5·29	6·42	4·99	3·52	3 83	12·34	8·51
" 16	Sure Growth Manure as sold.	24615	2·41	2·93	6·44	3·35	5 33	15 12	9·70
	As guaranteed.....			3·50				8·00	
	Standard Sample (1550)..		2·94	3 57	5·75	3·53	6·39	15·67	9·28
" 18	Phosphate Fertilizeras sold	24617	0·07	0.08	9·39	3·83	4·78	18·00	13·22
	As guaranteed.....							15.00	
	Standard Sample (1553)..				9·59	4·29	4·03	17·91	13·88
" 18	Reliance Flrtilizer as sold.	24616	2·10	2·55	3·25	0·68	4·74	8·67	3·93
	As guaranteed.....			2·60					6·00
	Standard Sample (1506).		1 68	2.04	6 84	1 35	4·60	12·79	8·19
	Montreal District.								
" 7.	Tankage Fertilizer as sold.	25125	7·70	9 35	0·73	8·45	2·04	11·22	9·18
	As guaranteed...		6·23	7 56				13·31	
	Standard sample (1500)..		6·78	8 22		10 88	2·39	13·27	10·88
" 7.	Tankage Fertilizer as guaranteed.	25126	8·82	10 71	0·45	6 41	2·23	9·09	6·86
" 7.	Standard Fertilizer as sold.	25127	2·97	3 61	7·83	1·34	3·27	12·44	9·17
	As guaranteed			2 50				11·00	9·00
	Standard sample (1536)..		2·52	3 06	7·16	1·15	3 65	11·96	8·31
" 7.	Bone and Potash as sold...	25128	2 66	3·23	6 39	3·28	4·79	14 46	9·67
	As guaranteed.....			2·00				9·00	
	Standard sample (1551)..		2·24	2·72	6 07	3 21	5·11	14·39	9 28
" 7.	Celery and Early Vegetable as sold.	25129	2·94	3 57	6 49	3·42	5 03	14·94	9·91
	As guaranteed.....			6 00				9·00	
	Standard sample (1552)..		5 29	6.42	4·99	3·52	3·83	12·34	8·51

of Fertilizers as sold in 1904—*Continued.*

Potash.	Moisture.	Relative value per ton of 2,000 lbs.	Manufacturer or Furnisher as given by Vendor.	Name and Address of Vendor.	No. of Sample.	Name and Observations of Analyst.
p. c.	p. c.	$ cts.				
5·37	12·52	17 85	Bowker Fertilizer Co., Boston.	D. Watson, Oak Hill Road, Kingsbury..	24605	Dr. J. T. Donald; not registered.
2·34	13·03	16 29			24606	
2·15	13·68	14 84			24607	
2·18	15·32	15 40			24608	
2·08	17·66	15 46		N. Darby, 1st Road of Racine, Ely, P.Q	24609	
2·37	13·85	15 51		N. Darby, 1st Road Racine, Ely.	24610	
3·56	10·76	17 62	The Nichols Chemical Co., Capleton.	O. C. Selby, Dunham, Missisquoi.	24611	Dr. J. T. Donald; above guarantee in ammonia and potash, but deficient in available phosphoric acid.
3·00						
4·49	9·75	18 65				
4·26	14·92	20 57	Bowker Boston	N. Maynard, Dunham	24612	Dr. J. T. Donald; not registered.
4·05	11·82	16 51	Nichols Chemical Co., Capleton, Que.	S. Vessot, & Co., Joliette, P. Q.	24613	Dr. J. T. Donald; deficient in available phosphoric and above guarantee in ammonia and potash.
3·00						
4·49	9·75	18 61				
4·47	17·01	25 08	W. A. Freeman, Hamilton, Ont.	Eug. Julien, St. Malo de Quebec.	24614	Dr. J. T. Donald; below guarantee in ammonia and potash but far above in phosphoric acid.
6·00						
7·64	8·80	32 76				
1·88	16·14	21 22			24615	Dr. J. J. Donald; below guarantee in potash but far above guarantee in phosphoric acid.
3·00						
3·07	11·75	23 55				
0·61	9·22	17 20			24617	Dr. J. T. Donald; above guarantee.
	6·65	19 36				
1·99	10·59	13 66	Nichols Chemical Co., Capleton, Que.	P. T. Legare, Quebec	24616	Dr. J. T. Donald; below guarantee in available phosphoric acid.
2·00						
3·76	10·15	19 36				
0·19	10·11	30 99	Vendors	Laing Packing and Prov. Co., Mill St., Montreal.	25125	Dr. J. T. Donald; above guarantee in ammonia, but below guarantee in phosphoric acid.
	11·24	28 95				
0·32	9·56	31 51	Vendors	Montreal Stock Yards Co., Mill St., Montreal.	25126	Dr. J. T. Donald; not registered.
2·44	13·43	22 13	Standard Chem. Co., Smith's Falls, Ont.	Brodie & Harvie, Bleury St., Montreal.	25127	Dr. J. T. Donald; above guarantee.
2·00						
2·08	8·50	19 67				
3·12	14·52	22 87	W. A. Freeman & Co., Hamilton, Ont.	Wm. Ewing & Co., McGill St,, Montreal.	25128	Dr. J. T. Donald; above guarantee in ammonia and phosphoric acid; below guarantee in potash.
6·00						
6·95	9·70	25 45				
2·47	17·21	23·27			25129	Dr. J. T. Donald; above guarantee in phosphoric acid; below guarantee in ammonia and potash.
6·00						
7·64	8·80	32 76				

TABLE II.—Results of the Examination of 96

Date of Collection.	Name of Sample or Brand.	No. of Sample.	Result of Analysis.							
			Nitrogen.			Phosphoric Acid.				
			Total in all States.	Total stated as Ammonia.	Soluble in Water.	Citric Soluble.	Insoluble.	Total.	Available.
1904.	*Montreal District*—Con.		p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.
April 7	Potato Manure as sold	25130	2·59	3 14	5·79	3·91	4·26	13·96	9·70
	As guaranteed.....			3·00				8·00	
	Standard sample (1554)		2·64	3·21	6·23	2·08	5·28	13·59	8 31
„ 7	Sure Growth as sold.	25131	3·01	3·65	5·17	4·36	3.51	13·04	9·53
	As guaranteed.....			3·50				8·00	
	Standard sample (1550)..		2·94	3·57	5·75	3·53	6·39	15·67	9·28
May 11	Special Fertilizer as sold ..	25136	3·11	3·88	8·04	0·15	3·08	11·27	8·19
	As guaranteed.....			3·50				10·00	8·00
	Standard sample (1535).		3·15	3·82	7 35	0·78	2·75	10·88	8 13
„ 10	Corn Phosphate as sold...	25137	1·40	1 70	6·43	1·88	1·14	9·45	8·31
„ 10	Vermont Phosphate as sold	25138	1·96	2·38	6·93	1·05	1·68	9·66	7·98
„ 10	Victor Fertilizer as sold...	25139	0·98	1 19	4·78	0·96	4·43	10·17	5·74
	As guaranteed.....			2·00					7·00
	Standard sample (1508)..		1·96	2 38	4·15	2·89	2·36	9·40	7 04
April 20	Fertilizer No. 1, as sold ...	25132	1·85	2 25	7·64	0·99	3·43	12·06	8·63
	As guaranteed			2·00				11·00	9 00
	Standard sample (1538)..		1·78	2·16	6·40	1·08	4 48	11·96	7 48
„ 20	Star Fertilizer, as sold.....	25133	1·85	2·25	3·91	0·22	4·73	8 86	.....
	As guaranteed.....			2 00				6·00	5·00
	Standard sample (1537)..		1·82	2·21	4·15	0·58	1·67	6·40	4·73
„ 20	Superphosphate of Lime, as sold.	25134	0·21	0 25	8·26	2·20	4·04	14·50	.....
	As guaranteed...							16 00	14·00
	Standard sample (1534)..		0·14	0.17	10·04	1·99	4·60	16·63	12 03
„ 20	Bradley's Eclipse, as sold..	25135	1·40	1·70	6 41	2·12	2·06	10·59	8 53
	As guaranteed.....		1·03	1·25	6·00	2·00	2·00	10·00	8 00
	Standard sample (1517)..		1·26	1·53	6 52	2·57	2·55	11·64	9·09
	Kingston District.								
„ 26	"Victor," as sold.....	25140	1·74	2 12	3·81	1·27	4·72	9·80	5·08
	As guaranteed.....			2 00					7 00
	Standard sample (1508)..		1·96	2 38	4·15	2·89	2·36	9·40	7 04
„ 26	Corn Special, as sold.	25141	1·95	2 37	4·46	1·23	4·34	10·03	5·69
„ 26	No. 1 Fertilizer, as sold ...	25142	1·19	1·45	7·41	1·91	4 08	13·40	9 32
	As guaranteed.....			2·00				11·00	9 00
	Standard sample (1538)..		1 78	2 16	6·40	1·08	4·48	11·96	7·48
„ 26	Royal Canadian, as sold...	25143	2·76	3 36	6·26	2·25	4·26	12·77	8·53
	As guaranteed.....			4 00					9 00
	Standard sample (1507)..		2·80	3 40	7·16	1·48	3·96	12·60	8 64
„ 26	Corn Special, as sold.....	25144	2·03	2·47	3·16	1 39	4·34	8·89	4·55
April 28	New Method, as sold ...	25145	1·17	1·42	5·65	1·50	2 81	9·96	7·15
	As guaranteed.....		1 03	1 25	6·00	2·00	2·00	10·00	8 00
	Standard sample (1520)..		1·08	1 31	7 84	2·24	2·39	12·47	10·08
„ 28	B. D. Seafowl Guano, as sold.	25146	1·52	1·85	4 29	4·88	3·07	12·24	9·17
	As guaranteed		2·06	2·50	6·00	2·00	1·00	9·00	8·00
	Standard sample (1573)..		2·10	2·55	6.85	1·01	3·33	11·19	7·86
„ 28	Lawn Fertilizer, as sold...	25147	1·36	1 66	8·36	1·45	2·27	12·08	9·81

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Samples of Fertilizers as sold in 1904—*Continued.*

Potash.	Moisture.	Relative value per ton of 2,000 lbs	Manufacturer or Furnisher as given by Vendor.	Name and Address of Vendor.	No. of Sample.	Name and Observations of Analyst.
p. c.	p. c.	$ cts.				
3·42	17·69	22 83	W. A. Freeman & Co., Hamilton, Ont.	Wm. Ewing & Co., McGill St., Montreal.	25130	Dr. J. T. Donald; according to guarantee.
5·00	.....	.....				
5·79	10·20	24 26				
2·19	15·92	22 15	" "	" "	25131	Dr. J. T. Donald; according to guaranteed value.
3·00	.....	.....				
3·07	11·75	23 55				
6·86	11·38	26 00	Standard Chemical Fertilizer Co., Smith's Falls, Ont.	Brodie & Harvey, Bleury St., Montreal.	25136	Dr. J. T. Donald; as guaranteed.
6·00	.....	.....				
7·00	8·55	26 03				
2·27	20·09	16 13	Bowker Fertilizer Co.	J. McCause, Hemmingford, Que.	25137	Dr. J. T. Donald; not registered.
4·08	14·61	19 33			25138	" "
3·77	17·04	14 59	Nichols Chemical Co.	Keddy & Kenny, Hemmingford, Que.	25139	Dr. J. T. Donald; deficient in available phosphoric acid.
3·00	.....	.....				
4·49	9·75	18 65				
1·59	16·04	17 73	Standard Chemical Fertilizer Co'y., Smith Falls, Ont.	Greeley Bros. & Thompson, Sutton, P.Q.	25132	Dr. J. T. Donald; above guarantee.
1·25	.....	.....				
1·64	9·40	16 54				
1·80	8·17	13 02			25133	Dr. J. T. Donald; according to guarantee.
2·00	.....	.....				
1·64	3·85	12 56				
0·29	12·17	14 38			25134	Dr. J. T. Donald; below guarantee.
.....	.....	.....				
.....	10·75	15 96				
2·29	16·23	16 56	Am. Agricultural Chemical Co. (Bradley).	J. W. Murphy, Sutton, P.Q.	25135	Dr. J. T. Donald; according to guarantee.
2·00	.....	.....				
2·27	10·65	17 05				
3·18	13·73	15 22	Nichols Chemical Co., Capelton, P.Q.	N. Willard & Co., Prescott, Ont.	25140	Dr. W. H. Ellis; unadulterated.
3·00	.....	.....				
4·49	9·75	18 65				
3·80	13·77	17 06	" "	" "	25141	Dr. W. H. Ellis; not registered.
1·47	13·70	16 84	Standard Chemical and Fertilizer Co.	Arthur Templeton, Oxford Mill, Ont.	25142	Dr. W. H. Ellis; unadulterated.
1·25	.....	.....				
1·64	9·40	16 54				
3·88	11·35	22 49	Nichols Chemical Co.	" "	25143	Dr. W. H. Ellis; unadulterated.
5·00	.....	.....				
6·68	9·40	25 68				
2·50	13·74	14 50	" "	H. Brown & Son, Brockville, Ont.	25144	Dr. W. H. Ellis; not registered.
2·16	9·70	14·58	American Agricultural Chemical Co. from stock of fall, 1903.	H. Brown & Sons, Brockville, Ont.	25145	D. W. H. Ellis, Unadulterated.
2·00	.....	.....				
4·51	9·52	20·10				
1·34	1·10	16 78	" "	" "	25146	
1·50	.....	.....				
1·52	9·80	17·37				
2·47	17·90	18·42	W. A. Freeman Co., Hamilton.	Hay, Flour and Seed Co., Brockville.	25147	not registered.

TABLE II.—Results of the Examination of 96

Date of Collection.	Name of Sample or Brand.	No. of Sample.	Result of Analysis.						
			Nitrogen.		Phosphoric Acid.				
			Total in all states.	Total stated as Ammonia.	Soluble in Water.	Citric Soluble.	Insoluble.	Total.	Available.
1904.	*Toronto District.*		p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.
April 13	Complete manure, as sold..	25148	3·64	4·42	4·82	4·32	2·39	11·53	9·14
	As guaranteed	.....	.....	.....	.....	.....	.....	.....	.....
	Standard sample (1519) ..	.....	.....	.....	.....	.....	.....	.....	.....
" 13	Potato Fertilizer, as sold ..	25149	3·01	3·66	5·81	2·51	1·85	10·17	8·32
	As guaranteed	....	2·06	2·50	5·00	3·00	2·00	10·00	8·00
	Standard sample (1519) ..	....	2·10	2·55	6·20	2·89	2·23	11·32	9·09
" 13	B. D. Seafowl Guano, as sold.	25150	2·25	2·73	5·74	2·90	2·15	10·79	8·64
	As guaranteed	.....	2·06	2·50	6·00	2·00	1·00	9·00	8·00
	Standard sample (1573) ..	....	2·10	2·55	6.85	1·01	3·33	11·19	7·86
" 13	Sure Growth, as Manure sold.	25151	2·76	3·36	5·36	3·04	5·76	14·16	8·40
	As guaranteed	.....	.....	3·50	.....	.....	.....	8·00	.....
	Standard sample (1550) ..	.....	2·94	3·57	5·75	3·53	6·39	15·67	9·28
" 13	Potato Manure, as sold	25152	2·39	2·91	5·75	3·11	5·67	14·53	8·86
	As guaranteed	....	.....	3·00	.....	.....	.....	8·00	.....
	Standard sample (1554) ..	.....	2·64	3·21	6·23	2·08	5·28	13·59	8·31
" 14	Seafowl Guano, as sold	25153	2·39	2·91	5·50	2·85	1·89	10·24	8·35
	As guaranteed	.....	2·06	2·50	6·00	2·00	1·00	9·00	8·00
	Standard sample (1573) ..	.....	2·10	2·55	6·85	1·01	3·33	11·19	7·86
" 14	Complete Manure, as sold.	25154	2·92	3·55	5·25	1·56	2·84	9·65	6·81
	As guaranteed	...	3·29	4·00	6·00	2·00	1·00	9·00	8·00
	Standard sample (1574) ..	...	3·36	4·08	6·09	2·74	3·00	11·83	8·83
" 14	New Method Fertilizer, as sold.	25155	2·07	2·52	5·79	2·77	1·90	10·46	8·56
	As guaranteed	.....	0·82	1·00	6·00	2·00	1·00	9·00	8·00
	Standard sample (1572) ..	.....	0·91	1·10	6·85	0·69	3·65	11·19	7·54
" 15	Celery and Vegetable Manure, as sold.	25156	2·85	3·47	6·00	2·98	4·36	13·34	8·98
	As guaranteed	.....	.....	6·00	.....	.....	.....	9·00	.....
	Standard sample (1552) ..	....	5·29	6·42	4·99	3·52	3·83	12·34	8·51
" 15	Tankage, A Brand, as sold.	25157	11·47	13·92	0·18	2·44	0·98	3·60	2·62
	As guaranteed	.....	9·13	11·08	.....	.....	.....	5·86	.....
	Standard sample (1501) ..	.....	9·60	11·66	.....	4·64	1·43	6·07	4·64
" 15	Bone Meal, as sold	25158	3·23	3·93	.....	15·98	9·66	25·64	15·98
	As guaranteed	.....	.....	3·00	.....	.....	.....	23 00	.....
	Standard sample (1557) ..	....	2 43	4·16	.....	15·51	9·75	25·26	15·51
" 15	Potato Manure, as sold	25159	2·85	3·47	5·60	3·04	5·91	14·55	8·64
	As guaranteed	.....	.....	3·00	.....	.....	.....	8·00	.....
	Standard sample (1554) ..	....	2·64	3·21	6·23	2·08	5·28	13·59	8·31
	London District.								
" 5	Fertilizer.	22207	4 12	5·00	4·15	2·73	4·03	10·91	.....
" 5	Agricultural Fertilizer	22208	3·40	4·13	4·02	3·12	4·10	11·24	.....
" 6	Thomas Phosphate, as sold.	22210	.....	.....	.....	14·20	3·70	17·90	.....
	As guaranteed	.....	.....	.....	.....	.....	.....	18·00	.....
	Standard sample (1583) ..	.....	.....	.....	.....	16·64	2·87	19 51	16·64
" 6	Bradley Fertilizer, as sold.	22215	3·08	3·74	.....	14·73	7·01	21·74	.....

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Samples of Fertilizers as sold in 1904—*Continued.*

Potash.	Moisture.	Relative value per ton of 2,000 lbs.	Manufacturer or Furnisher as given by Vendor.	Name and Address of Vendor.	No. of Sample.	Name and Observations of Analyst.
p. c.	p. c.	$ cts.				
7·58	11·22	28·66	American Agricultural Company.	Tetterington Bros., St. Catherines, Ont.	25148	Dr. W. H. Ellis; not registered
2·92	13·35	21·16	"	"	25149	" unadulterated.
3·00						
2·95	13·85	19·82				
1·95	12.80	18·60	"	"	25150	" "
1·50						
1.52	9·80	17·37				
2·67	17·45	21·46	W. A. Freeman Co., Hamilton, Ont.	R. R. Gage, G. T. R. Depot, St. Catherines, Ont.	25151	
3·00						
3·07	11·75	23·55				
2·80	16·06	21·17	"	"	25152	" below guarantee in potash.
5·60						
5·79	10·20	24·26				
1·86	13·42	18·45	Bradley Fertilizer Co.	R. Cooper, Welland, Ont.	25153	" unadulterated.
1·50						
1·52	9·80	17·37				
6·66	6·82	23·44			25154	
7·00						
7·33	8·75	27·72				
6·27	10·86	22·82			25155	
2·00						
3·34	11·30	15·92				
4·35	16·91	23·74	W. A. Freeman Co., Hamilton, Ont.	M. Taylor, Barrie, Ont.	25156	Dr. W. H. Ellis, adulterated being under guarantee in ammonia and potash.
6·00						
7·64	8·80	32·76				
0·00	6·13	30·70	Harris Abbatoir Co.	W. Rennie, Jarvis St., Toronto.	25157	Dr. W. H. Ellis, unadulterated.
	5·84	28·56				
	5·20	28·21	W. A. Freeman Co., Hamilton, Ont.	J. A. Simmers, King St., East Toronto.	25158	
	5·96	28·56				
3·13	16·32	22·52	"	"	25159	
5·00						
5·79	10·20	24·25				
6·66	6·53	26·88		George J. Thorp, Seed Merchant, Guelph.	22207	Prof. E. B. Kenrick, insufficiently described.
1·90	7·40	20·31	V. Evans & Co., Seed Merchant, Hamilton.	"	22208	" "
	0·44	18·21	Canadian Agt., J. Thomas, Phosphate	Isiah Holman, Miller, Berlin.	22210	Prof. E. B. Kenrick, genuine.
		20·30				
	5·63	25·67	Bradley Co., Rochester and Boston.	W. R. Marshall, Seed Merchant, Stratford.	22215	" insufficiently described.

TABLE II.—Results of the Examination of 96

Date of collection.	Name of Sample or Brand.	No. of Sample.	Result of Analysis. Nitrogen. Total in all States.	Nitrogen. Total stated as Ammonia.	Phosphoric Acid. Soluble in Water.	Phosphoric Acid. Citric Soluble.	Phosphoric Acid. Insoluble.	Phosphoric Acid. Total.	Phosphoric Acid. Available.
1904.	*District of London*—Cod.		p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.
" 8	Bone Meal, as sold	22218	1·54	1·87	.....	16·83	10·72	27·55	.....
	As guaranteed	.....	.....	1·50	.....	.....	.....	25·00	.....
	Standard sample (1596)	.....	1·40	1·70	.....	7·36	15·03	22·39	7·36
" 8	Ground Bone Fertilizer	22220	1·38	1·68	.....	17·33	12·02	29·35	.....
	As guaranteed	.....	.....	1·50	.....	.....	.....	25·00	.....
	Standard sample (1596)	.....	1·40	1·70	.....	7·36	15·03	22·39	7·36
" 11	Blood Meal Fertilizer	22225	11·84	14·38	.....	.....	.....	.....	.....
April 12	Potato Fertilizer	22228	2·11	2·56	4·95	3·33	2·42	10·70	.....
	As guaranteed	.....	.....	2·50	5·00	3·00	2·00	10·00	.....
	Standard sample (1519)	.....	2·10	2·55	6·20	2·89	2·23	11·32	9·09
" 12	Ingersoll Fertilizer, as sold	22229	6·76	8·21	.....	12·07	4·21	16·28	.....
	As guaranteed	.....	.....	9·00	.....	5·50	6·80	12·30	.....
	Standard sample (1549)	.....	7·00	8·50	Trace.	9·31	0·60	9·91	9·31
" 12	Fertilizer	22230	5·09	6·18	.....	4·53	2·40	6·93	.....
	British Columbia District.								
" 15	Fertilizer A, as sold	24937	3·99	4·70	9·80	0·10	0·10	10·00	.....
	As guaranteed	.....	4·00	4·86	.....	.....	.....	10·00	.....
	Standard sample (1585)	.....	3·78	4·59	11·51	1·15	Trace.	12·66	12·66
" 13	Fertilizer B, as sold	24938	2·92	3·55	9·20	0·30	0·10	9·60	.....
	As guaranteed	.....	3·50	4·25	.....	.....	.....	9·00	.....
	Standard sample (1586)	.....	3·57	4·33	10·74	0·77	Trace.	11·51	11·51
" 13	Fertilizer C, as sold	24939	0·58	0·71	12·40	0·50	0·10	13·00	.....
	As guaranteed	.....	.....	.....	.....	.....	.....	12·50	.....
	Standard sample (1587)	.....	Trace.	.....	13·30	1·60	Trace.	14·90	14·90
" 13	Superphosphate, as sold	24340	0·70	0·84	15·50	0·00	0·10	15·60	.....
	As guaranteed	.....	.....	.....	.....	.....	.....	16·00	.....
	Standard sample (1588)	.....	.....	.....	17·59	0·19	Trace.	17·78	17·78
" 13	Sulphate of Potash	24941	.....	.....	.....	.....	.....	.....	.....
	As guaranteed	.....	.....	.....	.....	.....	.....	.....	.....
	Standard sample (1591)	.....	.....	.....	.....	.....	.....	.....	.....
" 20	Muriate of Potash, as sold	24942	.....	.....	.....	.....	.....	.....	.....
	As guaranteed	.....	.....	.....	.....	.....	.....	.....	.....
	Standard sample (1592)	.....	.....	.....	.....	.....	.....	.....	.....
" 20	Nitrate of Soda, as sold	24954	15·50	18·80	.....	.....	.....	.....	.....
	As guaranteed	.....	16·00	19·43	.....	.....	.....	.....	.....
	Standard sample (1589)	.....	15·26	18·52	.....	.....	.....	.....	.....
" 20	Nitrate of Soda, as sold	24943	15·90	19·30	.....	.....	.....	.....	.....

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Samples of Fertilizers as sold in 1904—*Concluded.*

Potash.	Moisture.	Relative value per ton of 2,000 lbs.	Manufacturer or furnisher as given by vendor.	Name and Address of Vendor.	No. of Sample.	Name and Observations of Analyst.
p. c.	p. c.					
. . . .	3·57	25 41	Michigan Carbon Works, Detroit.	Darch & Hunter, Seed Merchants. London.	22218	Prof. E. B. Kenrick, genuine.
. . . . .	3·15	15 95				
. . . . .	3·91	25 97	Michigan Carbon Co., Detroit.	Percome & Donaldson, Seed Merchants, Strathroy.	22220	..
. . . . .	3·15	15 95				
. . . .	7·45	28 42	W. A. Freeman, Hamilton, Blood Meal Fertilizer.	Patrick Brothers, Seed, Flower and Feed Merchants, Woodstock.	22225	Prof. E. B. Kenrick; insufficiently described.
3·17	11·42	19 12	Bradley Fertilizer Co., Buffalo and New York.	Robertson & McKay, Hardware Merchants, Ingersoll.	22228	Prof. E. B. Kenrick; genuine.
3 00	. .	. .				
2·95	13·85	19 82				
. . .	6·65	30 75	Ingersoll Packing Co., Ingersoll.	Ingersoll Packing Co., Ingersoll.	22229	..
. . . . .	. .	. . .				
. . . . .	12·50	27 22				
. . .	3·94	18·93	London Soap Co., London.	London Soap Co., London.	22230	Prof. E. B. Kenrick; insufficiently described.
8·80	17·20	31 51	Victoria Chemical Co., Victoria.	Victoria Chemica Co., Victoria.	24937	Dr. C. J. Fagan; genuine.
7 00	. . . .	. .				
7·04	11·80	32 28				
12 80	14·00	32 43	..	..	24938	
11·00	. . . .	. . . .				
10 75	12·00	34 28				
12·70	13·70	30 29			24939	
11·00	. . . .	. . .				
10·75	11 95	29 00				
. . . . .	17·70	20 45			24940	..
. . . . .	. . . .	. . . .				
. . . .	11·20	21 30				
50·00	. . . . .	52 50	Bogardus & Co., Seattle, U.S.	M. J. Henry, Vancouver.	24941	..
50·00	. . . . .	. . .				
47·16	2·30	49 51				
50·80	. . . . .	53·34			24942	
50·00	. . . . .	. .				
46·64	5·45	49 30				
. . . . .	2·10	40 30	Victoria Chemical Co., Victoria, B.C.	J. Brown & Sons, Vancouver.	24954	
. . . . .	. . . . .	. . .				
. . . . .	3·00	39 67				
. . . . .	1·50	40 34	Bogardus & Co., Seattle, U.S.	M. J. Henry, Vancouver, B.C.	24943	

MEMORANDA ON MANURES.

Since this publication is intended for circulation among our farmers, it has been thought advisable to take advantage of its issue by reprinting some of the notes which have appeared in former bulletins, and adding a few additional particulars from works which have recently appeared, regarding the application of natural manures and artificial fertilizers.

It is about fifty years since Stoeckhardt, at that time professor in the agricultural school of Tharandt, Saxony, said that a farmer who bought guano, bonemeal, or other artificial fertilizers, and at the same time neglected to make proper use of the dung of the cattle on his own farm, must be regarded as an agricultural spendthrift. Every intelligent farmer in Canada will in these modern days agree with the old German professor, and maintain that the treasury of the farm is the dungstead, and that leaks and emanations from it of valuable fertilizing constituents must lead to financial embarrassment and possibly ruin.

This statement may be positively made without in the slightest degree detracting from the merits of artificial fertilizers, for when properly selected and applied, their value becomes abundantly evident. The question as to whether their use is remunerative has been frequently discussed, and depends to a large extent on the care employed in their selection. Supposing that the intelligent farmer has considered composition, cost, &c., to the best of his ability, made his selection and applied the fertilizer, he may still be in doubt as regards the result unless he takes steps to make a manure trial with it. As regards the best way of doing this, Hellriegel, in a publication, dated 1897, has related his experience. He recognizes how difficult it is for practical agriculturists, fully occupied with their regular work, and engaged in meeting all the difficulties caused by workmen, weather and market rates, to carry out regularly planned manure experiments. He therefore describes a method, which experience in his estimation had justified, and recommends it for the purpose of ascertaining whether any application of lime, marl, dung or fertilizers had really produced the improvement which from the point of view of cost had been expected. This plan is to pass over, at one or several places, properly selected, a few square rods of the field without applying the dung or fertilizer. In this way unmanured plots, which do not require to be measured with great exactitude, but merely paced, and do not need to be harvested separately, are left in the manured field, by means of which any improvement in the latter may be remarked and valued.

This plan exacts that it should be possible to *see* a distinct difference between the unmanured plots and the manured field, not only as regards the height and density of the resulting crop, but also in reference to the fullness of the ears and the development of the grains. In the event of such a distinct difference being invisible the manure is justly discredited as unfit for its intended purpose. It would seem advisable to recommend this plan to farmers who use fertilizers, because some of them may manure the whole field, fail to see any improvement on account of being unable to make comparisons, and perhaps condemn the fertilizer unjustly. The simplicity of the plan above described, and its applicability everywhere and every year would appear to commend it to the practical agriculturist. At the same time it is necessary to remark that there are instances on record of fertilizers having been applied and remaining utterly without effect owing to some defect in the soil. Such defects have often been cured by a previous application of marl or lime, which not only produced good effects themselves, but improved also the action of the fertilizers afterwards applied.

THE CARE OF NITROGEN.

This element is the most valuable of fertilizing constituents, and one which is exceedingly liable to loss.

In many of the fertilizers described in this and former reports their cost is very much increased by the admixture of nitrogenous constituents. This cost farmers might save by properly caring for the stock of nitrogen on their farms, and this stock might even be increased by cultivating those crops which have the power of appropriating the nitrogen of the atmosphere. Nevertheless the fertilizer manufacturers still seem to be under the necessity of supplying this element in considerable quantity in their goods, and of charging for it. In the case of the mixed fertilizers, this extra charge varies from $8 to $14 per ton, which the farmer must pay if he purchases, and which he can readily save in his own stables or produce upon his own farm.

Among the standard samples described in the present report for 1904 there are some whose guarantee in ammonia is placed at 1·50 p.c. and even at 1·00. Less than 1·50 p.c. of this ingredient is too small a quantity where its application is required, and where not needed it is useless to apply it. It is, as a rule, cheaper to purchase fertilizers containing large percentages of the fertilizing ingredients and apply a lesser quantity per acre.

Nearly the whole of the nitrogen in the fodder fed to farm stock is to be found in the excreta of the animals, and one-half of it is contained in the urine. It is further well known that 95 per cent of the potash contained in the food of cattle and sheep may be recovered by carefully saving the liquid manure only. It has, however, been ascertained that stable-yard manure experiences considerable loss of its fertilizing constituents, but more especially of nitrogen, when left to itself in the dung heap. According to the experiments of Wolff, this loss amounts to 55 per cent of the nitrogen contained in fresh manure from horned cattle. The later experiments of Heiden and Holdefleiss place it at 23·4 per cent. These results were obtained when ordinary reasonable care is taken of the manure, but give no data for estimating the loss which occurs when, as is very frequently the case in Canada, the manure is treated with the grossest neglect. It is safe to assume that, generally, 50 per cent of the nitrogen contained in the barn-yard manure of this country returns unutilized to the atmosphere, or is otherwise lost by careless treatment. Supposing that an average quantity of 36,000 pounds is produced in fresh condition annually by each animal, and that it contains 0·4 per cent of nitrogen it follows that a loss of 72 pounds of nitrogen, worth $8.64, takes place for each head of cattle. This loss can be prevented by daily strewing the stables with two pounds of ground plaster for each animal, which at once prevents any smell of ammonia from arising in the stable. The quantity prescribed means 700 lbs. or a cost of about $2.50 annually for each 1,000 lbs live weight, but by adopting this plan, the farmer would to a great extent be relieved from the necessity of purchasing the nitrogen of artificial fertilizers.

In a pamphlet published by Vieweg, 1859, entitled *Ein Pfund Stickstoff kaum einen Groschen*, which may be freely translated 'A pound of nitrogen for a penny,' Dr. Meyer-Altenberg maintained that ground gypsum is the very best preservative of barn yard manure when applied in the stable, because it secures 'certainty and completeness of effect, ease of execution, and the lowest possible cost.' He further described the effect of its application on the domain of Beberbeck in Hesse, and other impoverished farms, showing that it is possible to bring such into a fertile condition without the purchase of manure or fertilizers or feeding stuffs, excepting a little straw for bedding and oats for the horses.

TREATMENT OF STABLE-YARD MANURE.

Dr. Meyer-Altenberg, in the little work above mentioned, takes care to point out, that the use of gypsum, without subsequent careful treatment of the dungheaps, does

not give the desired effect, and he dwells on the importance of having the manure thoroughly trodden down, and made as compact as possible. This is also shown in Dr. J. Koenig's prize essay, 'How can the farmer preserve and increase the stock of nitrogen on his property?' (Berlin, 1887.) In a special chapter of this work the author discusses 'The evolution of free nitrogen during the fermentation and storage of stable manure, describes the experiments which were made from 1860 to 1885 regarding its treatment, and gives, finally, the results of the discussion from which the following sentences may be translated with advantage :—

1. In the decomposition of nitrogenous substances of every nature a loss, more or less considerable, of free nitrogen takes place.

2. This loss is the greater the more the atmosphere has access to the decomposing mass.

3. Too much moisture is just as hurtful as too little. Stable manure requires such a degree of humidity as permits its components to lie close to each other.

4. The addition of substances which fix ammonia (such as gypsum, kainite and kieserite) prevent or reduce the loss of nitrogen. *These substances are, however, of little or no value if care is not taken at the same time to prevent as much as possible the access of air.*

12. In storing stable manure in dungsteads the latter must be watertight and roofed in, and the treading down of their contents by the farm animals is to be recommended.

In a recent bulletin (No. 63) of the Pennsylvania State College Agricultural Experiment station (1903) some important experiments on steer-feeding are described which confirm some of the foregoing results. The following quotations are of interest :—'The trampled manure suffered little loss of fertilizing constituents, though less than two-fifths of the dry matter of food and litter was recovered in the manure.' 'The untrampled manure suffered more extensive losses of organic matter and nitrogen than the trampled manure, owing chiefly to the more complete exclusion of air in the latter case.'

One thing in connection with this question is perfectly certain and that is that the use of gypsum, or ordinary ground land plaster, prevents any loss of nitrogen in the stable, and while the manure is being forwarded to the dungheap. Further if the work from which the foregoing quotations have been made be carefully studied, and also the experiments and writings of Holdefleiss, Vogel and others, it appears to be quite certain that the use of the same article, or the gypsum produced in the manufacture of 'acid-phosphate,' completely prevents the loss of ammonia from the liquid part of the manure, and also from the organic nitrogen of the solids, provided the whole has, previous to fermentation, been made thoroughly compact, and atmospheric air almost completely excluded. Where it is found impossible to attend to the latter precautions, the safest way will probably be found to lie in avoiding fermentation altogether, by conveying the fresh manure, after treatment with gypsum, on the field to be manured and bringing it under the soil as rapidly as possible. The latter practice has been proved to be most advantageous by the experiments which have been carried on for some time past, at the Central Experimental Farm by Director Saunders. (See Reports for 1898.)

Not only has the addition of substances which have the faculty of fixing ammonia been recommended for stable manure, but its improvement to a greater extent has been proposed by the addition of fertilizers. The following quotation is taken from Bulletin No. 45 (for March, 1897) of the Massachusetts Agricultural College, and was written by Dr. C. A. Goessmann, Chemist for that institution :—

'*The practice of adding to the manurial refuse materials of the farm as stable manure, vegetable compost, &c., such single commercial manurial substances as will enrich them in the direction desirable for any particular crop to be raised, does not yet receive that degree of general attention which it deserves.*' (The italics are in the original.) 'An addition of potash in the form of muriate or sulphate of potash, or of phosphoric acid in the form of fine ground South Carolina or Florida soft phosphate, &c., will in many

instances not only improve their general fitness as complete manure, but quite frequently permit a material reduction in the amount of barn-yard manure ordinarily considered sufficient to secure satisfactory results.'

'Average composition of seventy-five samples of barn-yard manure:—

	Per cent.	Lbs. per ton.
Moisture	67·00	1,340·0
Nitrogen	0·52	10·4
Potassium oxide	0·56	11·2
Phosphoric acid	0·39	7·8

'The average barn-yard manure contains, it will be noticed from the above statement, a larger percentage of nitrogen, as compared with its potash and phosphoric acid than is generally considered economical. An addition of from thirty to forty pounds of muriate of potash, and of one hundred pounds of fine ground natural phosphate (soft Florida or South Carolina floats) per ton of barn-yard manure would greatly increase its value as an efficient and economical general fertilizer.'

These are no doubt most excellent suggestions, and there is no reason why these substances should not be introduced into the stable manure in the same manner as in the case of the ground plaster above mentioned. Plain superphosphate and kainite might also be used, some of the constituents of which would be useful in fixing the ammonia, as soon as formed from the organic nitrogen. Should this suggestion be found to have practical value, there is no doubt that our fertilizer manufacturers would be found able to supply our farmers, at a moderate cost, with a mixture of ground plaster, superphosphate and kainite, in such proportions as experience might show to be most advantageous. No better application can be made of the wood ashes produced in the farmer's household than by mixing them with the barn-yard manure, and most excellent results are known to have followed this practice.

ACQUISITION OF NITROGEN.

Not only can the farmer save almost the whole of the nitrogen contained in the fodder fed to his cattle, but he can actually increase the stock of it stored away in his fields, agricultural products and manure heaps, by a judicious course of crop rotation. For more than a century agricultural chemists have discussed the question as to whether free, atmospheric nitrogen can be assimilated by plants, but it may now be regarded as perfectly settled in the affirmative, if regard is had only to the plants of the order leguminosae, such as beans, pease, lentils, vetches, clovers, alfalfa, serradella, &c. Even the great English agriculturists, Sir J. B. Lawes and Sir Henry Gilbert, who had previously been of an opposite opinion, have now admitted that this appropriation of nitrogen has been completely proved. This acknowledgment was made by Sir Henry Gilbert, at a great meeting of agricultural chemists held at Halle, in Germany, in September, 1891. Thus, modern research has confirmed not only modern agricultural practice, but also the experience of antiquity, for Prof. W. Strecker has pointed out a passage in Pliny which says: 'Lupines require so little manure that they, in fact, replace it; vetches make the land more fertile. Corn should be sown where previously lupines or vetches have stood, because they enrich the land.'

It is not, however, to be supposed that this utilization of atmospheric nitrogen by leguminous plants can take place upon very poor soils or upon those destitute of the inorganic constituents which they require. The latter must in such cases be supplied in the shape of potash with some phosphoric acid, as was done with great success by Schultz, of Lupitz, a practical agriculturist in North Germany. In fact, had it not been for his investigations, the controversy above referred to might have continued without results up to the present hour.

Professor Kœnig, of Muenster, gives the following summary of Schultz's experience:—

'Schultz acquired the farm Lupitz in the year 1855; its soil consisted of a poor, cold diluvial sand; the profit in working it was very small. Lupines yielded, indeed,

as a fodder tolerable results, but when used as green manuring for rye and oats, no return was obtained from them. The application of artificial manures produced good crops, but they did not pay; burnt lime showed itself to be too heating. The use of manure was more favourable, especially when fertilizers containing phosphoric acid were used at the same time. But at the best the total result was not satisfactory.

'Shortly after Schultz acquired Lupitz, the great discovery of potash salts was made, and about 1860 they began to be pro luced from the mines of Stassfurth. Schultz made up his mind to try them as manure and he obtained the most surprising results. After lupines had shown the uselves to be useless as forerunners of grain, they were excluded from the rotation and grown on a separate field without any manuring and alternating with sheep pasture. But the harvest on these became worse and worse until the field in question became quite lupine "sick." Schultz made his first trial on this field, manuring it with 300 pounds kainite per morgen (1 Prussian morgen = 0·631 acre); the sickness was at once cured, and for twenty-five years afterwards Schultz grew lupines on this ground without interruption, always with the application of 300 pounds kainite. Schultz obtained similar good results on the ground which had received the marl, by the application of potash salts. This ground had indeed yielded well with lupines for two years after the application of the marl, but in the third year they sickened here too. When, however, 300 pounds kainite were applied here and ploughed in, the ground was cured, although an application of phosphates had not produced the desired results.

'The favourable influence which the manuring with kainite or potash salts had exerted on lupines induced Schultz to try them on grain, in conjunction with phosphates. But in this case he obtained contradictory results, according to the nature of the crops which preceded the grain. For instance while grain sowed after lupines and manured with potash and phosphates yield very good and remmunerative harvests, these were not to be obtained if grain was grown after grain or after potatoes. This behaviour of these crops was explained by Schultz in this way: that lupines or deep-rooted plants leave in the soil after harvest a residue of root, in which a considerable amount of nitrogen has accumulated, an amount sufficient to supply the wants of the following grain crops; that, on the other hand, the application of potash and phosphates, to grain, after a preceding grain crop, is without effect, for the reason that the latter has consumed the stock of nitrogen. Grain crops always reduce this stock; never increase it. Schultz has given the name of "nitrogen collectors" to the lupines and similar plants, while grains are called "nitrogen consumers." His system of rotation is therefore the following:—Sow first nitrogen collectors (lupines, pease, beans, vetches, clover, lucerne, serradella, &c.), or, as they have been called, renovating crops, and give them 300 pounds kainite per morgen, with perhaps an addition of 20 pounds phosphoric acid. After harvesting the nitrogen collectors, sow a nitrogen consumer, raising a grain or exhausting crop, giving it also 300 pounds kainite and 20 pounds phosphoric acid. The grain crop is perfectly successful, because the first crop left behind it nitrogen enough to supply the wants of the grain. In this way the keeping of stock, which is expensive on a poor sandy soil, can be reduced and the purchase of nitrogenous fertilizers dispensed with, because the nitrogen collectors are able to stock the soil with that valuable element.'

The foregoing description is taken from Professor König's 'Stickstoff Vorrath,' published in 1887 (Paul Parey, Berlin). It was in 1884, nearly thirty years after the purchase of his sandy farm, that Schultz, of Lupitz, published the results of his experience, although they did not contain anything very new and although they only confirmed experiences still older than his own. But his case was surprising and his explanation of the cause of his successful farming challenged the attention of scientific agriculturists. The consequence has been the issue of many pamphlets on the subject, and an activity in the region of agricultural experimenting which is not yet ended. Atwater, Wagner, Heiden, Hellriegel and many others have participated in these investigations, and Professor Wood, of the Storrs Agricultural School in Connecticut, has given the following general conclusions as the result of the work:—

1. 'Pease, alfalfa, serradella, lupine, clover in all probability, and apparently leguminous plants in general, are able to acquire large quantities of nitrogen from the air during their period of growth.

2. 'There is scarcely room to doubt that the free nitrogen of the air is thus acquired by plants.

3. 'That there is a connection between root tubercles and this acquisition of nitrogen is clearly demonstrated. What this connection is, what are the relations of micro-organisms to the root tubercles and the acquisition of nitrogen, and in general how the nitrogen is obtained are questions still to be solved.

4. 'The cereals with which the experiments have been completed have not manifested this power of acquiring nitrogen, nor do they have such tubercles as are found on the roots of legumes.

5. 'In the experiments here reported, the addition of soil infusions did not seem necessary for the production of root tubercles. A plausible supposition is that the micro-organisms or their spores were floating in the air and were deposited in the pots in which the plants grew.

6. 'As a rule the greater the abundance of root tubercles in these experiments, the larger and more vigorous were the plants and the greater was the gain of nitrogen from the air.

7. 'In a number of these experiments, as in similar ones previously reported, there was a loss of nitrogen instead of gain. The loss occurred where there were no root tubercules; it was especially large with oat plants, and largest where they had the most nitrogen at their disposal in the form of nitrates. As the gain of nitrogen by the legumes helps explain why they act as renovating crops; the loss in the case of the oats suggests a possible reason why they should appear to be an exhausting crop.

'Practical inferences:—The ability of legumes to gather nitrogen from the air helps to explain the usefulness of clover, alfalfa, pease, beans, vetches and cow pease as renovating crops, and enforces the importance of these crops to restore fertility to exhausted soils. The judicious use of mineral fertilizers (containing phosphoric acid, potash and lime) will enable the farmer to grow crops of legumes which, after being fed to his stock, will, with proper care to collect and preserve all manure, both liquid and solid, enable him to return a complete fertilizer in the shape of a barn-yard manure to his land. A further advantage of growing these crops is that the nitrogenous material, protein, which they contain in such great abundance, is especially valuable for fodder.'

From the foregoing it seems that, in the present condition of our knowledge, the conclusion may be drawn that the atmosphere stands ready to furnish the farmer, gratis, with all the organic constituents which his crops require, provided always that he, on his part, will exercise a sufficient amount of skill and intelligence in appropriating and retaining on his farm the fertilizing materials, and especially the nitrogen. If he does this, all that is necessary for him to provide, in order to replace the losses which his farm sustains from the sale of stock or produce, are the inorganic or mineral constituents of these, and especially the phosphoric acid and potash. There is much in all this to remind one of Sprengel and Liebigs teaching of fifty years ago, according to which a plant cannot thrive if its soil does not contain all the substances which are to be found in its ash.

UTILIZATION OF SEWAGE.

The losses in fertilizing material which are sustained, as above mentioned, on account of the neglect or unscientific treatment of barn-yard manure, are very trifling when compared with those which the community suffers in the almost total loss of the nitrogen, phosphoric acid and potash contained in human excreta. The utilization of such always becomes a subject for discussion when the question is raised as to how a cheaper class of manures than the artificial fertilizers can be obtained for use in agriculture.

Where the water carriage system of removing sewage and excrement has been introduced, nothing is to be hoped for in the recovery of their fertilizing constituents. Even in cases where, at large expense, establishments have been erected for the treatment of sewage by precipitation or similar methods, the products have been found to be

entirely destitute of agricultural value. The greater part of the fertilizing constituents of sewage are in such a soluble condition, and have been diluted with water to such an extent, as to render their recovery economically impossible. It has been attempted in the neighbourhood of many cities in England and on the continent of Europe to use the sewage for irrigation and as liquid manure, but this method of utilization has been found to be in the highest degree imperfect. At Berlin, it has been proved, that of the nitrogen contained in its sewage, at the very most only 13·8 per cent is found in the agricultural products of all the magnificent farms irrigated by it in the neighbourhood of the city. When the use of water for removing house refuse is excluded, and ordure and urine are removed as manure in their natural state, their utilization is possible, and is made a sourse of revenue in such towns as Stuttgart, Groningen, Greifswald, &c. But the systems of this class which are in use have all their disadvantages, as is proved by the tendency which municipal authorities constantly show to adopt the water carriage system. The greatest disadvantage under which these systems labour is the difficulty caused by the offensiveness to sight and smell of the material with which they have to deal. This has been entirely met by the use of moss litter as an absorbent, deodorizer, and disinfectant.

MOSS MANURE.

The first public mention of the usefulness of moss litter as a deodorizer and absorbent seems to have been made by Dr. Ludwig Happe, in Braunschweig, in December, 1880, since which time its application for the purpose has gradually increased until now, when the system has been introduced into several towns in Germany, and is also practised in Congleton, Cheshire, England. In Canada this method of deodorizing human refuse has been in use for years at Caledonia Springs. It, of course at once recalls the dry earth system regarding which great expectations were at one time entertained. The advantages of moss litter over dry earth for the purposes in question are, however, very decided. They consist in the perfect inoffensiveness of the moss litter product, in the fact that one part of moss litter will deodorize and dry at least six parts of mixed excreta, and in the greater agricultural value of the resulting manure. Dry earth (which is required in quantity at least equal to that of the excreta) is valueless from an agricultural point of view, but this is not the case with moss litter, which, as its analyses show, often contains as much nitrogen as ordinary barn-yard manure. Numerous analyses have been made of moss litter manure as produced in Germany, and its average contents from seven different towns may here be stated.

	p. cent.	lbs. per ton.		Value per ton.
Nitrogen	0·644	13·28	at 13c.	$1 72
Phosphoric acid	0·350	7·00	5	0 35
Potash	0·285	5·70	5¼	0 30
				$2 37
Water	83·00			

Numerous trials have been made on various crops with this manure, and very satisfactory results are always reported. In all cases it is stated to excel barn-yard manure even when the latter is used in much greater quantity.

In a paper read before the Royal Society of Canada, on May 27, 1902, Mr. T. Macfarlane describes a manner of applying the moss litter, by means of which the quantity used is much reduced, and the value of the resulting manure greatly increased.

Canada possesses in its bogs and swamps inexhaustible quantities of moss litter, which is frequently found in beds several feet in thickness lying above the peat. The

following tests have been made in the Inland Revenue Laboratory of moss litter from various localities in the Dominion :—

	Moisture.	Ash.	Nitrogen.
	Per cent.	Per cent.	Per cent.
Moss litter, Berwick, N.S.	14 40	1 16	1 [illegible]
Black muck, "	13·30	[illegible]	1·58
Moss from Great Village, N.S.	65 44	3·46	0·63
Sphagnum moss from Shippegan, N.B.	12 45	1·35	0·55
Light coloured moss litter from Lincoln Parish, N.B.	11 55	1·40	1 [illegible]
Dark coloured sample from the foregoing locality	10 95	0 80	1 [illegible]
Moss litter from Musquash, N.B., upper layer	11 [illegible]	0·95	0·82
Moss litter from same locality, lower layer	12 50	0·90	0 72
Peat from St. Bridget, Province of Quebec	13 30	2·50	1·48
Peat from St. Hubert, Quebec	12 35	2 68	1·84
Light coloured moss litter from Caledonia Springs	10 00	1 60	2·95
Dark coloured moss litter from same locality	11 60	2 70	2 [illegible]
Peat from the same locality	10 05	3 90	2 [illegible]
Surface moss from the Mer Bleu at Eastman's	10 85	2·80	0·71
Surface moss from the Mer Bleu at Baldwin's Farm	7 90	2·66	1 47
Surface moss from the Mer Bleu at Baldwin's Farm, 18 inches deep	27 [illegible]	1 72	1·64
Peat from Mer Bleu at McFadden's Farm, wide ditch, Navan	22·60	4·40	2·21
Peat from Mer Bleu, McFadden's Farm, narrow ditch, Navan	9 40	6·62	2·80
Peat from near Stratford, Ont.	16 80	9·10	1·91
Hypnum moss from near Stratford, Ont.	8 75	9·72	2·01
Moss litter from bog in Welland County, Ont	3·85	4·70	1 51
Peat lying underneath the foregoing	5 30	4·85	1·41
Peat from the same locality, lying 4½ feet below surface	3 25	41 25	1·52
Peat from Dodson's bog, near Beaverton, Ont	18 42	9·04	1·89

The manufacture of moss litter has been attempted at Musquash, in New Brunswick, and it has been produced in Welland county, Ontario. From the latter locality several bales of the moss litter were supplied for experimental purposes, and Dr. Laberge, of Montreal, undertook to superintend the carrying out of an experiment to determine its deodorizing and absorbent qualities. He reported that 100 lbs. of moss litter were sufficient for drying 800 lbs. of ordinary excreta from privy pits in Montreal, and rendering it entirely inoffensive. A sample of the product remained for days in his office without attracting notice and, indeed, it was quite devoid of odour. Its analysis gave the following results :—

	p.c.	Lbs. per ton.			Value per ton.
Nitrogen	1·31	26·2	at	13c.	$3 41
Phosphoric acid	0·90	18·0	"	5	0 90
Potash	0·14	2·8	"	5¼	0 15
Water	65·47				$4 46

The valuation of ordinary fresh barn-yard manure with 75 per cent of water is about $2 per ton ; with 67 per cent water as in the case of the average given above by Dr. Goessmann, the value is nearly $2.25. Therefore, much better results might be expected agriculturally from a 'moss manure' of the composition just described.

Moss litter might also be applied with great advantage in public urinals. When a sample of it was supersaturated with urine and artificially dried, and this process repeated several times, no offensive odours were developed and the product was found on analysis to contain 12·41 per cent of nitrogen, which is equal to a valuation of $32.26 per ton.

These facts are reported in order to show that Canada possesses in her waste lands abundance of material which might be used in our towns and villages for the production of a very valuable manure, with the simultaneous introduction of very many sanitary advantages. It is not to be expected that cities or towns which are advantageously situated for the water carriage system, or which have already adopted it, will make any changes, but there are many towns and villages in the Dominion where the application of the moss litter system would be very suitable, and the authorities of which, by selling the product or giving it gratis to the farmers of the neighbourhood, might confer a great benefit on agriculture.

APPENDIX L.

BULLETIN No. 98—WHEATEN FLOUR.

OTTAWA, July 22, 1904.

W. J. GERALD, Esq.,
Deputy Minister of Inland Revenue.

SIR,—During the months of January and February last, samples of wheaten flour were obtained in all the collection districts of the Dominion as required in your letter of January 14, 1904. These are described in the statement, Table I appended to this report from which it will be seen that the number of samples collected in the various districts was as follows :—

Halifax	8
Prince Edward Island	2
New Brunswick	6
Quebec	13
Montreal	12
Kingston	7
Toronto	8
London	7
Winnipeg	4
Calgary	2
British Columbia	6
Total	75

The results of testing these samples are given in Table I which also contains all the information obtained by the food inspectors as regards the designations of the various brands, and the names of the manufacturers or furnishers. Many of the samples were simply sold as 'flour,' and it is quite possible that the manufacturers names as given by the vendors may not be accurate. Besides the descriptions of the 75 purchased samples there have also been introduced into the table the results of examining 7 standard samples of flour obtained from the Secretary of the Board of Trade, Montreal, as well as of 4 samples of their regular brands furnished by the Lake of the Woods Milling Co. These will be found useful for purposes of comparison, and perhaps afford a means of ascertaining whether any of the samples collected in the open market are of abnormal quality.

The characters possessed by the samples are detailed in the various columns of Table I and under the following numbers :—1. Total nitrogen ; 2. wheat proteids ; 3, 4 and 5. gluten ; 6, 7 and 8. degree of fineness as shown by bolting ; 9. acidity ; 10. Total ash ; 11, ratio of proteids to dry gluten. It will thus be seen that, besides being chemically examined, all the samples were subjected to some of the practical tests known to millers. Regarding the value of the results stated in Table I the following remarks may be made.

In no case of the purchased samples does the ash exceed 0·85 per cent, and the highest ash of the Montreal standard samples is 0·82 per cent. This demonstrates that there is no such thing practiced in Canada as the addition of inorganic substances to wheaten flour, and disproves most effectually the absurd rumour occasionally heard that very white and very finely ground gypsum is sometimes used for adulterating flour.

No indication has been found of the admixture in these samples of flour from any other or lower priced grain. Such an addition would in the case of maize flour be economically possible, but would result in lowering the quantity of gluten yielded by the sample. All those samples in which the percentage of dry gluten was less than 10 or in which the ratio of dry gluten to proteids was less than 1·2 to 1 have however been examined under the microscope without the discovery of any foreign starch. The number of samples so examined amounts to 37 and it was thought quite unnecessary to examine the others. It is therefore safe to conclude that no suspicion of adulteration by foreign grain attaches to any sample of Canadian flour.

The fineness of the various samples is indicated in columns 6, 7 and 8, which show the results of the bolting test. The quantity remaining on bolting cloths Nos. 10 and 12 indicates the coarser particles present which no doubt, when the flour is made into dough, require a somewhat longer time to take up the necessary quantity of water. It may here be mentioned that no attempt has been made to determine the degree of whiteness of the various samples. The differences are so extremely slight that Lovibonds Tintometer was found useless for the purpose. The finest product in bolting is usually a shade lighter in colour than that collected between No. 10 and 12 bolting cloths, but it was not considered of sufficient importance to attempt to record this in the case of each sample.

It is generally supposed that the value of wheaten flour for breadmaking purposes depends on the quantity and elasticity of the gluten which it contains. As regards quantity it would appear that flours are on sale in Canada which give widely different per centages on being subjected to the gluten test. The columns 3, 4 and 5 give the results yielded by this process, which consists in making up 25 grammes of flour with as much water as is necessary to make a ball of stiff dough. This is then allowed to rest half an hour in order that the flour particles may be completely permeated by the water. The ball is then kneaded by the fingers over a fine hair sieve and under a stream of tepid water, until all the starch is removed and the water passes off perfectly clear, when the crude or wet gluten remains, brown coloured, soft and more or less elastic. The latter quality should be noted, although there is no precise means of expressing the degree of elasticity. After all excess of water has been squeezed out of the crude gluten it is made to assume the form of a thin round cake, and weighed in the moist condition. It is afterwards dried in the water bath at 98°C, and the loss of water calculated on the wet or crude gluten. The three results for each sample were thus obtained, which are recorded in Table I. With reference to the percentage of water in the crude gluten, it has been said that it is highest in the flours best adapted for breadmaking, and that the water in glutens from first class flours amounts to 70 p.c., while the medium grades yield glutens containing only 62 to 65 p.c.* These statements are not supported by the numbers given under columns 3, 4 and 5, because none of the crude glutens from the standard samples contain more than 64·6 p.c. water and none of the collected samples yield a gluten with more than 69·8 p.c. The percentages of dry gluten yielded by the Montreal standard samples range from 15·64 to 8·08 per cent. Among the collected samples are some whose dry gluten is beyond these limits. Although consisting essentially of the proteids of the flour, the quantity of dry gluten does not correspond to that of the proteids calculated from the nitrogen percentage given in column 2 of Table I., but is usually much higher It contains, besides proteids, small quantities of fat, fibre and other substances.

As regards the quality of the various samples a wide variation is also fundamentally exhibited in the percentages of nitrogen given in column 1, which range from 2·23 down to 1·15 per cent. It will be seen that, in calculating the proteids in column 2 from the nitrogen, 5·7 has been substituted for the old factor 6·25. This has been done in deference to the investigations of Osborne & Voorhees, and the practice of Prof. Snyder. Instead of 16, the old percentage of nitrogen which all vegetable proteids and animal albumenoids were assumed to contain, glutenin and gliadin, the chief nitrogenous constituents of wheat, contain respectively 17·49 and 17·66 per cent. The correspond-

* Observations on flours. Balland ; Journal of the Society of Chemical Industry, 1895, p. 379.

ing factors for converting the nitrogen into the proteids would be 5·72 and 5·66. In his recent paper on the determination of gliadin* Professor Snyder adopts 5·7 as the factor for the total proteids, which practice it will be convenient to follow in regard to all the different proteids of wheaten flour. From column 2 it will be seen that the wheat proteids contained in the purchased samples vary from 12·71 down to 6·56 per cent, which means that some flours contain twice as much as do others of these valuable flesh and blood forming substances. Among the Montreal standards the proteids range from 10·69 to 7·34 per cent, and it appears that, out of the 75 collected samples, 16 have percentages outside of these limits. Ten are above 10·69 per cent in wheat proteids and six are below 7·34. It will be seen later that some of these have been subjected to a closer chemical examination.

The names given to the Montreal standards must not be taken as affording any indication of the origin of the wheats which yielded the flours. These may come from the winter-grown grain of Ontario, or the hard varieties of Manitoba or may be from mixtures of both. Neither is there anything in the designations of the purchased samples to show from what variety of wheat they are derived. It appears that there is no such thing in these modern times as grinding the whole of any particular lot of grain into flour, shorts and bran. Much more frequently flour is obtained from a mixture of different varieties of wheat, and different grades of flour may be obtained from the one mixture. The art of milling has been revolutionized and its operations are difficult to follow.

It has already been mentioned and will be seen from Table I that the percentage of dry gluten is invariably higher than that of the wheat proteids. This is not surprising, for an average sample of dry gluten consisting of a number of cakes from different flours ground up together was found to contain only 12·40 per cent of nitrogen which corresponds to 70·68 per cent of wheat proteids, or what Jago has called "true gluten." If in the gluten test there were no loss of nitrogenous substances the ratio of proteids to dry gluten would therefore be about 1 : 1·43. This figure is actually reached in the case of "Strong Bakers'" among the Montreal standards and in two brands among the flours made by the Lake of the Woods Milling Co., as will be seen on consulting column 11 of Table I. Among the samples taken in the open market this ratio varies from 1 : 1·41 to 1 : 0·82, but it would be wrong to assume that the lower a flour is in the percentage of proteids, the lower will be the relative quantity of dry gluten which the flour yields. There are flours entered in the table in which the percentage of wheat proteids is about 8 and the proportion of these to dry gluten is 1 : 1·39. On the other hand there are samples with about 11 per cent true gluten in which the ratio in question is as 1 is to 1·12. This ratio would appear however to be of value for indicating the physical character of the gluten in a flour, independently altogether of its percentage. The following quotation from †Jago will help to explain this matter. 'The value of estimations of true gluten as a check on those of crude gluten has already been indicated, but they have also an additional importance. Suppose, for example, two flours each yield 35 per cent of wet gluten. One is hard, elastic and springy, while the other is soft and flabby, and causes the washing water to become 'lathery'. It will at once be said that the former is the higher quality gluten of the two, and quite correctly; but, further, the results would be entered that each yielded the same quantity of gluten. This latter deduction is not all the truth, for in the former case hardness of the gluten will have permitted most of the starch to be entirely eliminated with the least possible loss of real gluten constituents. In the second instance the gluten will have begun to wash away while yet there is a considerable quantity of starch remaining.' It would, therefore, seem reasonable to conclude that the higher the proportion of dry gluten to the wheat proteids or true gluten, the greater is the "strength" of the flour, the firmer the gluten and the less its liability to lose proteids in the washing.

Of late years some authorities have come to the conclusion that a determination of the gliadin in flour is one of much importance. As long ago as 1898, Dr. Emile

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*Science and Art of Breadmaking, 1895, p. 514. †Journal of the American Chemical Society, xxvi, p. 26.

Fleurent† wrote thus on the subject :—'The gluten of wheaten flour consists of a mixture of two principal products, the one glutenin, a pulverulent matter; the other gliadin, a viscous sticky flowing substance. It is according to the relative proportions in which these two substances enter into the constitution of different glutens that the latter owe their greater or lesser degree of elasticity and the irregular manner in which they behave during the process of fermentation and baking. A gluten very rich in glutenin is dry and short, it does not rise easily and gives after baking a compact mass; a gluten too rich in gliadin behaves well during fermentation because it is soft and yielding, but, in baking the gliadin dissolves before coagulating, the gaseous products escape, the dough spreads itself and collapses forming a scarcely porous mass and giving the appearance of badly raised bread.' Allen* states that "so far as known, wheat is the only seed the flour of which yields a tough elastic gluten-mass on treatment with water. It is the gliadin which imparts to wheat-flour the property of forming a stiff, elastic dough, capable of retaining vesicles of gas, and thus producing a light and porous loaf.' Not only from a scientific point of view has a determination of the gliadin in wheaten flour been thought desirable but practical millers in the United States have deemed the matter to be worthy of attention and have endeavoured to ascertain the percentage of this proteid in the wheat they purchase and the flours they manufacture. Reference has already been made to Prof. Snyder's process for this purpose. On the other hand doubts have been expressed as to the utility of such a determination, and, in a very recent article on flour†, Hans Stein, a millowner in Silesia remarks that Fleurents method of separating gluten into its constituents had led to no comprehensible results. Nevertheless from the point of view of the ordinary miller and consumer it seems desirable to attempt the estimation of gliadin and to make closer analyses of wheaten flour for the purpose of ascertaining the essential differences in the qualities of the various flours found on the market, and the value of the names attached to the samples which are each year put forward as standards by the representatives of the grain trade.

It was found impossible to subject all the samples collected to this closer examination but a selection was made from among the samples described in Table I, and the results of their analysis are given in Table II, most of the work connected with which was done by Miss S. E. Wright. The headings in this table explain themselves for the most part, but it seems necessary to describe briefly the manner of operating, and explain how the results tabled under Alcohol Extract were obtained. In order thoroughly to expose the particles of flour to the action of the various solvents, it was distributed through crysotile fibre (Canadian asbestos) placed in so-called Macfarlane tubes which had previously been furnished with a filtering bed. The tube used has a total depth of 75 mm. of which 15 mm. are occupied by the tubulature at the bottom. The body of the tube is 60 mm. long with an outside diameter of 40 mm. A small piece of fine wire gauze is placed over the tubulature and upon this a small quantity of crysolite fibre. Over this a fine filtering bed is laid by pouring into the tube, placed over the water pump, a small quantity of pulp made of hornblendic asbestos, similar to that used for the Gooch crucible. The rest of the tube is filled up with crysotile fibre, through which the flour submitted to analysis is distributed. After drying and extracting with petrolic ether, the tubes are treated in the extraction apparatus with alcohol of 60 per cent by volume. In this as in the fat extraction, the solvent is boiled on a plate heated electrically, and thus all danger from the breaking of a flask and the inflammability of the solvents avoided. On boiling the 60 per cent alcohol in the lower flask it returns from the condenser of a strength varying from 80 to 85 per cent by volume and percolates the tubes. The extraction is completed in seven hours, but it has sometimes been found convenient to start it at night and allow it to continue till morning, unattended, which can be done without danger. Two tubes are extracted together each containing 2½ grammes, and, by drying and weighing these, the loss sustained by the flour is ascertained. The extract from these 5 grammes is deprived of its alcohol,

* Organic Analysis IV, p 75. † Zeitschrift für Untersuchung der Nahrungs und genussmittel, 1904, p 730.
† Manuel d'Analyse Chimique, p 310.

and then divided into equal parts, one of which is used for determining the nitrogen by the Kjeldahl method, and the other for the estimation of the sugars. The sum of these determinations subtracted from the loss sustained by the flour gives the amount of non-nitrogenous substances extracted by the alcohol. The gliadin in the alcohol extract is ascertained on multiplying its nitrogen by 5·7. On deducting the gliadin from the total proteids the quantity present is ascertained of glutenin and other proteids insoluble in alcohol. From the relative quantities of total proteids and gliadin the figures given in the last column are obtained. How far this percentage of gliadin in the total proteids has any practical value cannot at present be decided. Among some of the collected flours it is as low as 28 per cent, but it has to be remembered that some of these were selected for closer examination because of their abnormal characters in other respects.

It may be stated that the average sample of dried gluten referred to above was subjected to the same examination as the samples in Table II and gave the following results :—

	Per-centage.
Total nitrogen	12·40
" proteids (N × 5·7)	70·68
Moisture	3·68
Fat	0·36
Alcohol extract, containing—	
Reducing sugar stated as dextrose	0·43
Sugar after inversion stated as sucrose	0·41
Gliadin (N of alcohol extract × 5·7)	5·52
Non-nitrogenous substances	7·92
Water extract	2·72
Glutenin and other proteids insoluble in alcohol	65·15
Total ash	2·72
Starch and fibre (by diffierence)	11·09
	100·00

These results were confirmed by an experiment made on crude or wet gluten. From this it appears that dry gluten contains on the average only 70·68 p.c. of proteids and that of these only 5·52 parts are soluble in alcohol. Since the proteids in wheat flour contain from 32 to 58 p.c. of gliadin or alcohol soluble proteid, it would appear that in the gluten test a considerable percentage must be carried away by the water. If the proteids in the dry gluten operated on had contained say 45 p.c. of gliadin then 31·95 p.c. of the gluten should have been extracted by alcohol ; whereas the total alcohol extract is only 14·28 and of this only 5·52 is gliadin. It may, however, be the case, as has been maintained by other observers, that gluten as such does not preexist in flour, or that its constituents enter into a state of more intimate combination under the influence of water when the flour comes to be made into dough.

The present report is to be regarded as the first contribution from this laboratory on the analysis of flour. Unfortunately I am at present unable to say with certainty in what respects all the results now submitted coincide with or illustrate points in the miller's practical experience. I hope, however, that this report, if published, may attract the attention of practical men, and that I may hereafter have an opportunity of consulting with them and possibly of reaching more definite conclusions.

I have the honour to be, Sir, your obedient servant,

THOMAS MACFARLANE,
Chief Analyst.

INSPECTION OF WHEATEN FLOUR—

Date of Collection.	Nature of Sample.	Number of Sample.	Name and Address of Vendor.	Cost. Quantity.	Cost. Price.	Name and Address of Manufacturer or Furnisher as given by Vendor.
1903.	*Halifax District.*			Lbs.	Cts.	
Jan. 27	Splendid Brand. . .	20422	D. Wood, Windsor, N.S.	4½	15	Delong & Lamen, Boston, Mass.
" 27	. . . . .	20424	Graham & Co., Windsor.	. . . . .	. . .	Flavelle Milling Co., London, Ont.
" 27	. . . . .	20426	Murphy & DeMont, Windsor.	. . . . .	. . . .	Wolverston Milling Co., Ont.
" 27	Sunbeam	20432	Brown & Graham, Halifax.	. . . . .	. .	Not stated . . . . .
" 27	. . . . .	20434	R. T. Forristall, Halifax.	. . . . .	14	Ratz Bros., Ont . . . . .
" 27	Golden Crown. . . .	20438	M. J. Hopgood " . .	. . . . .	. . .	Wood Bros., Ont. . . .
" 27	Halifax	20440	Burgess & Quinn " . .	. . . . .	. . . .	Kent Milling Co., Ont. . .
" 27	Queen City	20442	H. W. Wentzell & Co., Halifax.	. . . . .	. . . .	A. Campbell, Toronto Junction.
	Prince Edward Island District.					
" 26	Wheat Flour	24402	Bur & Goff, Charlottetown.	1½	5	Tilson & Co. . . . .
" 27	"	24406	Brace & McKay, Summerside.	. . . . .	4	Brock Milling Co. . . .
	New Brunswick District.					
	Wheat Flour—					
Jan. 23	'Golden Star'	23807	W. F. Campbell, 16 Germain St., St. John.	3	10	Jas. Goldie, Waterloo, Ont.
" 23	'Royal Household'.	23808	J. F. Shaw, cor. Waterloo and Golding Sts., St. John.	1½	6	Ogilvie Milling Co., Montreal.
	Family flour—					
" 28	'White Satin'	23813	The (2) Barkers, Ltd., 287 Main St., Moncton.	1½	10	Jas. Cullen, Woodstock. Ont.
" 28	'Five Roses' . . . . . (Pastry Flour)	23814	John O'Neil, Main St., Moncton, N.B.	1½	10	Lake of the Wood Milling Co., Keewatin.
Feb. 4	Home Trade. . . . . (Pastry Flour)	23818	Hughes & Maxwelle, King St., St. Stephen, N.B.	1½	10	Rolph Smith & Co., Toronto, Ont.
" 5	Harvest Moon . . . . (Pastry Flour)	23821	John McKnight, Regent St., Fredericton.	. . . . .	. . . . .	A. F. Randolph & Sons, Fredericton.
	Quebec District.					
Jan. 25	Wheat Flour	23651	Aug. Beausoleil, Terrebonne.	1½	5	H. P. Labelle, Montreal.
" 26	"	23653	J. J. Soumis, Joliette . . .	1½	5	The Alexander Brown Milling Co.
" 27	"	23659	Paquette Frères, Berthierville.	1½	6	Z. Boulanger, Berthierville.

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TABULATED STATEMENT, I.

Results of Examination.												
		Gluten.			Bolting.						Name of Analyst.
Total Nitrogen. 1	Albuminoid Proteid N×5·7. 2	Gluten in Crude. 3	Dry Gluten. 4	Water in Gluten. 5	Coarser than No. 10. 6	Between 10 and 12. 7	Finer than 12. 8	Acidity, stated as Lactic Acid. 9	Total Ash. 10	Ratio of Proteid to Fibrous Ash. 11	Number of Sample.	
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.		
1·68	9·58	29·50	11·83	66·95	0·16	1·32	95·27	0·108	0.44	1:1·23	20422	J. G. A. Valin.
1·89	10·77	24·14	8·84	63·3	0·15	12·49	78·68	0·094	0·26	1:0·82	20424	Wheat starch only; A. Lemoine.
1·40	7·98	23·11	7·86	65·98	0·20	6·50	87·01	0·101	0·68	1:0·98	20426	J. G. A. Valin; wheat starch only; A. Lemoine.
1·48	8·44	29·99	11·40	61·98	0·68	6·76	86·72	0·072	0·52	1:1·35	20432	J. G. A. Valin.
1·61	9·17	34·57	13·01	62·36	0·07	7·20	85·54	0·072	0·36	1:1·41	20434	
1·47	8·38	23·31	8·34	64·22	0·08	12·85	80·08	0·108	0·40	1:0·99	20438	Wheat starch only; A. Lemoine.
1·54	8·78	28·29	9·85	65·01	0·27	6·26	84·52	0·115	0·48	1:1·12	20440	
1·54	8·78	28·93	11·08	64·17	0·17	9·89	80·92	0·130	0·84	1:1·26	20442	J. G. A. Valin.
1·47	8·37	25·68	8·40	67·29	0·16	0·27	97·32	0·101	0·11	1:1·01	24402	Miss E. Davidson; wheat starch only, A. Lemoine.
1·40	7·98	26·54	8·92	66·39	0·24	1·00	97·72	0·129	0·11	1:1·12	24406	
1·15	6·56	23·67	8·62	53·59	0·32	2·51	96·43	0·108	0·11	1:1·31	23807	"
1·88	10·72	38·07	12·70	66·64	0·36	6·35	92·37	0·122	0·05	1:1·18	23808	Miss E. Davidson.
1·40	7·98	28·32	9·52	66·38	0·08	4·00	95·96	0·123	0·11	1:1·19	23813	Wheat starch only; A. Lemoine.
1·71	9·75	33.59	11·97	64·33	0·76	12·00	86·00	0·094	0·16	1:1·23	23814	Miss E. Davidson.
1·55	8·84	29·07	9·74	66·49	0·08	3·84	95·60	0·108	0·14	1:1·10	23818	Wheat starch only; A. Lemoine.
1·55	8·84	29·37	9·55	67·48	0·18	1·61	92·40	0·101	0·10	1:1·08	23821	"
1·51	8·60	25·72	10·21	60·30	0·10	2·02	96·02	0·158	0·52	1:1·18	23651	J. G. A. Valin; wheat starch only; A. Lemoine.
1·15	6·56	19·56	6·60	66·25	0·04	1·04	98·54	0·108	0·02	1:1·00	23653	"
1·43	8·15	27·45	9·90	63·93	0·04	14·40	84·96	0·194	0·08	1:1·21	23659	J. G. A. Valin.

INSPECTION OF WHEATEN FLOUR—

Date of Collection.	Nature of Sample.	Number of Sample.	Name and Address of Vendor.	Cost.		Name and Address of Manufacturer or Furnisher as given by Vendor.
				Quantity.	Value.	
1904.	*Quebec District*—Con.			Lbs.	Cts.	
Jan. 27	Wheat Flour.....	23661	L. J. Giroux & Cie.....	1½	5	Z. Boulanger, Berthierville.
" 28	"	23663	Thos. Bournival, Trois Rivières.	1½	3	David Murphy, Montreal
" 29	"	23670	L. Gingras, 304 Richilieu, Quebec.	.....	9	Poitras & Paradis, Quc..
" 29	"	23672	S. Hamel, 106 D'Aiguillon St., Que.	.....	5	J. B. Renaud et Cie., Quebec.
" 29	"	23675	Mrs. F. Coveny, 2 St. Patrick St., Que.	.....	5	D. Z. Drolet, Quebec....
" 29	Stockwell's Patent....	23677	H. G. Kell, 80 St. Augustin.	.....	.....	.....
Feb. 4	"	23679	E. Lafontaine, Drummondville.	1½	4	Lake of the Woods Milling Co., Montreal.
" 4	"	23683	Oscar Piché, Drummondville.	.....	5	E. Lafontaine, Drummondville.
" 5	"	23684	Demers & Lorange, Notre Dame of St. Hyacinthe	.....	4	S. Papillon, Notre Dame of St. Hyacinthe.
" 5	" ...	23685	Gustave Jeannotte, St. Joseph de St. Hyacinthe.	3	13	Viau Frères, St. Hyacinthe.
	Montreal District.					
	Wheat flour—					
Jan. 10	'Champion'.....	23184	A. Fournier, 1789 St. Catherine St.	2	6	.....
" 20	'Ocean Brand'.....	23185	C. E. Authier, 1758 St. Catherine St.	1½	6	.....
" 20	'Patent'.....	23186	A. Mercier, 498 Dorchester St.	.....	5	.....
" 20	'First Prize'.....	23187	L. G. Thouin, 487 Lagauchetierre St.	2	6	.....
" 21	.....	23188	M. F. Lafortune, 116 St. Maurice St.	1½	6	Laporte, Martin & Co.
" 21	'Champion'.....	23189	Pilons & Meilleur, 114 St. Maurice St.	5	.....	.....
" 21	.....	23190	A. Lamy, 2021 Notre Dame St.	.....	.....	Magor Bros. & Co.....
" 21	.....	23191	Joseph Deneau, 53 Juror St.	.....	.....	Howe, McIntyre & Co ..
" 22	.....	23192	A. Massicotte & Co., 1472 St. Catherine St.	.....	6	C. Roy, Montreal. ...
" 22	Eagle Brand.	23193	T. Bergeron, 1522 St. Catherine St.	.....	.....	.....
" 22	'White Bread' Brand.	23194	C. Coderre, 1358 Notre Dame St.	.....	.....	.....
22	'Bijou'.....	23195	G. St. Pierre, 1350 Notre Dame St.	.....	.....	.....

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TABULATED STATEMENT, I—*Continued.*

Results of Examination.												
		Gluten.			Bolting.							Observations.
Total Nitrogen.	Wheat Proteïds N × 5·7.	Crude.	Dry.	Water in Crude.	Coarser than No. 10.	Between 10 and 12.	Finer than 12.	Acidity, stated as Lactic Acid.	Total Ash.	Ratio of Proteïd to Dry Gluten.	Number of Sample.	
1	2	3	4	5	6	7	8	9	10	11		
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.		
1·61	9·17	27·28	11·27	59·43	0·04	1·28	98·57	0·100	0·30	1:1·22	23661	J. G. A. Valin.
1·41	8·04	24·64	8·87	64·00	0·02	3·10	94·13	0·130	0·10	1:1·10	23663	〃 〃 〃 〃 〃 〃 starch only; A. Lemoine.
1·40	7·98	25·30	9·34	60·30	0·08	4·30	94·20	0·122	0·46	1.1·17	23670	〃 〃 〃 〃 〃 〃
1·53	8·72	27·42	10·40	62·07	0·02	1·68	97·82	0·158	0·32	1:1·19	23672	〃 〃 〃 〃 〃 〃
1·47	8·38	27·27	9·32	65·82	0·01	1·25	98·16	0·137	0·10	1:1·11	23675	〃 〃 〃 〃 〃 〃
1·51	8·60	25·92	9·97	61·52	0·00	1·00	98·32	0·072	0·40	1:1·15	23677	〃 〃 〃 〃 〃 〃
1·55	8·84	28·50	11·26	60·49	0·00	3·52	95·57	0·158	0·60	1:1·27	23679	J. G. A. Valin.
1·40	7·98	24·72	11·08	59·59	0·08	2·75	96·44	0·100	0·10	1:1·38	23683	〃 〃 〃 〃 〃 〃
2·07	11·80	31·48	12·83	59·24	0·46	13·68	85·72	0·120	0·12	1:1·08	23684	〃 〃 〃 〃 〃 〃 wheat starch only; A. Lemoine.
....	....	....	....	....	....	....	....	....	....	....	23685	This sample was not tested, being a self-raising flour.
1·316	7·50	28·08	9·98	....	0·02	0·91	98·82	0·158	0·36	1:1·33	23184	Miss S. E. Wright.
1·365	7·78	29·45	10·85	....	0·08	1·84	97·48	0·122	0·44	1:1·39	23185	〃 〃 〃 〃 〃 〃
1·351	7·70	25·20	8·61	....	0·03	2·93	96·77	1·130	0·12	1:1·12	23186	〃 〃 〃 〃 〃 〃 wheat starch only; A. Lemoine.
1·386	7·90	26·77	10·05	....	0·60	6·32	92·55	0·137	0·22	1:1·26	23187	Miss S. E. Wright.
1·40	7·98	23·56	7·84	66·7	0·12	2·95	undet.	0.101	0·40	1:0·98	23188	Miss E. Davidson; wheat starch only; A. Lemoine.
1·62	9·24	31·58	10·49	66·7	0·05	1·71	〃	0·129	0·28	1:1·13	23189	〃 〃 〃 〃 〃 〃
1·51	8·61	32·99	9·94	69·8	0·04	2·60	〃	0·129	0·50	1:1·15	23190	〃 〃 〃 〃 〃 〃
1·61	9·18	29·10	9·70	66·6	0·04	2·61	〃	0·101	0·45	1:1·06	23191	〃 〃 〃 〃 〃 〃
1·86	10·60	33·48	11·83	65·7	0·07	7·04	〃	0·245	0·85	1:1·11	23192	〃 〃 〃 〃 〃 〃
1·51	8·61	28·58	8·80	69·2	0·06	1·46	〃	0·108	0·40	1:1·02	23193	〃 〃 〃 〃 〃 〃
1·54	8·78	29·13	9·78	66·4	0·06	1·18	〃	0·101	0·43	1:1·11	23194	〃 〃 〃 〃 〃 〃
1·55	8·84	29·85	9·85	67·0	0·04	0·56	〃	0·165	0·45	1:1·12	23195	〃 〃 〃 〃 〃 〃

INSPECTION OF WHEATEN FLOUR—

Date of Collection.	Nature of Sample.	Number of Sample.	Name and Address of Vendor.	Cost.		Name and Address of Manufacturer or Furnisher as given by Vendor.
				Quantity.	Price.	
1904.	*Kingston District.*			Lbs.	Cts.	
Jan. 28	Pastry flour	25008	Peter Glavey, 37 York St., Ottawa.	1½	6	
" 28	'Gem'	25009	H. O. Richer, 31 York St., Ottawa.		5	
" 28	"	25010	P. L. Foisy, 297 Dalhousie St., Ottawa.		6	McEvoy & Son
" 29	'C' Brand	25011	A. D. Adams, King St., Brockville.		5	Jas. Cummings, Lyn, Ont.
" 29	'A' "	25012	Wm. Rhodes, King St., Brockville.		4	" "
" 29	Hungarian	25013	T. Brown & Co., King St., Brockville.		5	Ogilvie Milling Co.
" 29	Hunts Best	25014	" "			Hunt Bros., London
	Toronto District.					
Feb. 2	Elgin Brand	25030	James Irvine, 552 Queen St. West, Toronto.	1½	5	John Campbell, St. Thomas.
" 2	Monarch	25031	" "	1½	5	Arch. Campbell, Toronto.
" 2	Jubilee	25032	J. Bond, 559 Queen St. West, Toronto.	1½	5	Citizen Milling Co.
" 3	Eagle Brand	25033	A. Janatta & Co., 400 Queen St. W., Toronto.	1½	5	Fairless Milling Co.
" 3	Golden Cream	25034	J. Summer, 306 Queen St. West, Toronto.	1½	5	
" 3	Gold Medal	25035	D. Sutherland, 295 King St. East, Hamilton.	1½	5	Lake & Bailey
" 3	White Rose	25036	F. H. Blain, 87 John St., Hamilton.	1½	5	John Thompson
" 3	Gold Medal	25037	" "	1½	5	Lake & Bailey
	London District.					
Jan. 23	Crest	22186	A. G. Ault, Seaforth	1	3	Seaforth Milling Co., Seaforth.
" 27	'Juliet'	22190	John Byers, Stratford, Ont.	1	3	Stratford Milling Co.
" 28	'Daily Bread'	22192	Webber & Co., Berlin	1	3	Shirk & Snider, Bridgeport, Ont.
" 28	'Maple Leaf'	22196	J. A. McCray, Guelph	1	3	James Goldie, Guelph
" 29	"	22199	Armstrong Bros., Fergus.	1	3	Grand Valley Mills
Feb. 6	"	22202	H. Levins, Seaforth	1	3	H. F. McAllister, Ethel, Ont.
" 6	Three Star	22205	T. J. Vidian, Goderich	1	3	Goderich Milling Co.
	Winnipeg District.					
Feb. 9	Flour	23924	Metcalf & Mitchell, Brandon.	1½	5	Ogilvie Milling Co.
" 10	"	23928	M. R. Shurman, Virden.			Oak Lake Milling Co.

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TABULATED STATEMENT, I—*Continued.*

Results of Examination.												
		Gluten.		Bolting.								Observations.
Total Nitrogen.	Wheat Proteids N × 5·7.	Crude.	Dry.	Water in crude.	Coarser than No. 10.	Between 10 and 12.	Finer than 12.	Acidity, stated as Lactic Acid.	Total Ash.	Ratio of Proteid to Gluten.	Number of Sample.	
1	2	3	4	5	6	7	8	9	10	11		
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.		
2·23	12·71	42·26	15·86	62·4	0·08	8·00	90·60	0·115	0·67	1:1·25	25008	Miss E. Davidson.
2·21	12·60	43·94	15·18	65·5	0·05	2·85	95·68	0·173	0·67	1:1·20	25009	
1·75	9·98	34·15	13·08	61·43	0·01	7·32	92·74	0·201	0·54	1:1·31	25010	
1·73	9·86	36·28	12·67	65·08	0·01	7·22	92·37	0·144	0·42	1:1·28	25011	
1·43	9·15	31·07	10·29	66·88	0·28	5·28	94·36	0·122	0·42	1:1·26	25012	
1·75	9·98	37·07	13·94	62·39	0·01	15·64	84·33	0·144	0·32	1:1·39	25013	
1·63	9·29	33·73	12·79	62·10	0·02	20·44	79·60	0·165	0·52	1:1·37	25014	
1·34	7·64	30·44	10·30	66·16	0·02	2·96	96·66	0·122	0·64	1:1·34	25030	Miss E. Davidson.
1·33	7·58	20·51	8·76	57.29	0·02	0·42	99·25	0·115	0·58	1:1·16	25031	wheat starch only; A. Lemoine.
1·40	7·98	29·13	9·96	65·81	0·05	16·64	82·60	0·115	0·48	1:1·25	25032	Miss E. Davidson.
1·26	7·18	22·25	7·38	66·83	0·00	0·75	98·93	0·130	0·64	1:1·03	25033	Alph. Lemoine; no foreign starch.
1·33	7·58	21·24	7·38	65·24	0.02	1·70	97·84	0·100	0·38	1:0·97	25034	
1·40	7·98	22·94	7·88	65·60	0·00	1·46	98·18	0·129	0·50	1:0·98	25035	
1·19	6·78	20·06	8·44	57·93	0·00	0·44	99·14	0·115	0·48	1:1·24	25036	
1·33	7·58	27·47	9·00	67·23	0·06	2·03	97·90	0·108	0·48	1:1·19	25037	
1·49	8·49	29·18	9·19	68·50	0.00	0·88	98·89	0·108	0·44	1:1·08	22186	Alph. Lemoine; wheat starch only.
1·44	8.20	28·74	9·33	71·46	0·00	0·82	98·89	0·100	0·48	1:1·37	22190	
1·47	8·37	31·12	10·36	66·70	0·00	1·00	98·87	0·108	0·42	1:1·24	22192	Alph. Lemoine; wheat starch only.
1·55	8·86	27·22	9·99	63·29	0·04	5·04	94·56	0·115	0·44	1:1·13	22195	Miss E. Davidson; wheat starch only.
1·67	9·50	33·29	11·82	64·49	0·01	3·28	96·80	0·130	0·50	1:1·24	22199	Miss E. Davidson.
1·57	8·94	31·71	11·39	64·08	0·02	0·68	99·00	0·108	0·42	1:1·17	22202	
1·97	11·25	40·97	14·89	63·66	0·00	4·44	95·60	0·137	0·38	1:1·32	22205	
2·02	11·49	42·88	14·81	65.54	0·00	10·16	89·82	0·122	0·42	1:1·29	23924	Miss E. Davidson.
1·93	11·01	34·44	12·34	64·16	0·01	3·58	96·12	0·101	0·36	1:1·12	23928	wheat starch only; A. Lamoine.

INSPECTION OF WHEATEN FLOUR—

Date of Collection.	Nature of Sample.	Number of Sample.	Name and Address of Vendor.	Cost. Quantity.	Cost. Price.	Name and Address of Manufacturer or Furnisher as given by Vendor.
1903.	*Winnipeg District*—Con.			Lbs.	Cts.	
Feb. 12	Flour.	23930	Matheson Bros., Winnipeg.			Ogilvie Milling Co...
" 12	"	23933	W. E. Innis, Winnipeg..			Lake of the Woods Milling Co.
	Calgary District.					
Feb. 10	Wheat flour	21777	H. A. Thompson, Strathcona, Alta	1½	5	Edmonton Milling Co., Edmonton
" 16	"	21780	Larue & Picard, Edmonton, Alta	1½	5	The Dowling Milling Co., Edmonton
	British Columbia District.					
Feb. 2	Wheat flour	24921	W. Findlay, Vancouver.	4½	0 15	Hudson Bay Co., Man..
" 5	"	24930	H. A. Edgett & Co., Vancouver	4½	0 10	Ogilvie, Man.
" 5	"	29431	Dominion Grocery Co., Vancouver	4½	0 25	D. McLean, Moosejaw Mills
" 8	"	24932	C. G. Turner, Vancouver	4½	0 15	Columbia Flouring Mills, Ltd., Enderby, B.C...
" 8	"	24933	J. F. May "	4½	0 15	Portland Flouring Mills, Portland, Oregon
" 8	"	24934	E. H. McMillan "	4½	0 25	Lake of the the Woods Milling Co., Keewatin
	Standard samples for the year 1903, obtained from Montreal Board of Trade.					
	Strong baker's					
	Patent spring					
	Superfine					
	Fine					
	Exra					
	Straight roller					
	Patent winter					
	Samples from Lake of the Woods Milling Co.—					
	Medora					
	Strong bakers					
	Five Roses					
	Patent					

SESSIONAL PAPER No. 14

TABULATED STATEMENT I—*Concluded.*

Results of Examination.													
		Gluten.			Bolting.								
1—Total Nitrogen.	2—Wheat Proteids. N × 5.7.	3—Crude.	4—Dry.	5—Water in crude.	6—Coarser than No. 10.	7—Between 10 and 12.	8—Finer than 12.	9—Acidity, stated as Lactic Acid.	10—Total Ash.	11—Ratio of Proteids to Dry Gluten.	No. of Sample.	Name of Analyst.
p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.		
1·96	11·17	39·57	14·41	63·58	0·01	12·88	87·04	0·144	0·50	1:1·29	23930	Miss E. Davidson.
1·88	10·69	36·00	12·97	63·97	0·01	1·67	98·29	0·101	0·40	1:1·21	23933	"
1·652	9·41	39·31	13·27	66·24	0·01	6·73	92·91	0·216	0·68	1:1·41	21777	Miss E. Davidson.
1·630	9·29	29·85	10·52	64·74	0·14	2·12	96·60	0·151	0·48	1:1·13	21780	"
1·680	9·58	35·12	12·62	64·06	0·00	3·94	96·01	0·108	0·46	1:1·31	24921	"
1·960	11·17	44·79	15·70	64·94	0·08	9·70	90·20	0·144	0·48	1:1·40	24930	"
1·036	5·91	22·50	7·79	65·38	0·01	0·89	98·69	0·115	0·46	1:1·32	24931	"
1·740	9·92	39·86	13·32	66·58	0·02	0·36	99·27	0·122	0·42	1:1·34	24932	"
1·050	5·98	20·93	7·39	64·69	0·01	1·82	97·70	0·108	0·46	1:1·24	24933	"
1·666	9·50	32·96	11·88	63·95	0·01	7·76	91·58	0·101	0·32	1:1·25	24934	"
1·876	10·69	41·27	15·64	62·1	1·63	11·13	85·80	0·173	0·68	1:1·46		
1·841	10·49	37·29	13·20	64·6	1·76	14·81	82·94	....	0·16	1:1·26		
1·834	10·45	32·26	12·02	62·7	0·28	1·73	96·22	....	0·82	1:1·15		
1·792	10·21	31·93	12·52	60·6	4·08	15·62	80·20	....	0·54	1:1·22		
1·687	9·62	34·90	12·92	62·9	0·08	5·48	93·01	.....	0.52	1:1·34		
1·386	7·90	24·90	8·86	60·4	0·04	4·07	95·21	.....	0·10	1:1·12		
1·288	7·34	22·32	8·08	63·7	0·08	5·31	93·58	.....	0·18	1:1·10		
2·149	12·24	43·83	16·71	61·8	0·03	5·27	94·56	0·245	0·30	1:1·36		
2·016	11·49	42·01	16·82	59·9	0·02	2·79	95·68	0·194	0·36	1:1·46		
1·827	10·41	36·91	13·64	63·0	0·03	10·56	89·28	0·137	0·16	1:1·31		
1·743	9·94	44·57	17·42	60·9	0·04	4·63	95·12	0·144	0·16	1:1·75		

TABLE II.—Results of the Analyses of Certain Samples of Wheaten Flour.

	No. of Sample.	Total Proteids N × 5·7.	Moisture.	Fat.	Extracted by Alcohol.				Extract by Water after Alcohol.	Glutenin and other Proteids insol. in Alcohol.	Total Ash.	Starch and Fibre by difference.	Percentage Gliadin in total Proteids.
					Reducing Sugar or Dextrose.	Sugar after inversion as Sucrose.	Non Nitrogenous substances.	Gliadin.					
		p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.
Standard Flours from Board of Trade, Montreal													
Strong Bakers		10·69	8·64	0·76	0·08	0·85	3·58	5·65	0·48	5·04	0·68	74·24	52·85
Patent Spring		10·49	8·00	1·90	0·12	1·80	2·16	5·84	1·75	4·65	0·16	73·61	55·67
Superfine		10·45	8·68	0·92	0·58	1·78	1·04	3·36	5·48	7·09	0·82	70·25	32·15
Fine		10·21	7·52	1·00	0·43	3·84	1·50	4·39	3·36	5·82	0·51	61·60	42·99
Extra		9·62	8·84	0·74	0·31	1·18	0·63	4·56	3·92	5·06	0·52	74·24	47·40
Straight Roller		7·90	8·88	0·30	0·66	0·11	1·98	4·50	2·32	4·38	0·10	76·77	56·96
Patent Winter		7·34	8·16	0·30	0.23	1·11	0·00	1·28	2·68	3·88	0·18	79·18	58·31
Samples from Lake of the Woods Milling Co., Montreal –													
Medora		12·24	10·20	0·80	0·12	1·99	2·56	5·52	0·92	6·72	0·30	70·87	50·09
Strong Bakers		11·49	8.61	0·86	0·04	1·68	2·79	5·65	0·32	5·84	0·36	73·82	49·17
Five Roses		10·41	12·20	1·94	0·08	0·77	4·60	4·96	0·40	5·45	0·16	69·44	47·64
Patent		11·17	10·40	0·54	0·29	1·13	2·28	5·58	3·32	5·59	0·16	70·71	49·12
Samples collected in the open market as shown in Table I –													
Graham & Co., Windsor, N.S.	20424	10·77	9·32	0·84	0·19	0·31	1·38	3·99	1·92	6·78	0·26	65·01	37·04
Murphy & Demont, "	20426	7·98	9·42	0·88	0·31	0·52	1·48	4·16	2·16	3·82	0·68	76·77	52·13
W. F. Campbell, St John, N.B.	23807	6.56	9·60	0·66	0·27	1·21	0·00	3·57	3·56	2·99	0·11	78·00	54·42
J. F. Shaw, "	23808	10·72	9·72	0·64	0·46	0·26	2·21	4·39	0·86	6·23	0·05	75·18	40·95
J. J. Soumis, Joliette, P.Q.	23653	6·56	8·54	0·80	0·27	1·33	1·48	2·68	1·60	3·88	0·02	79·40	40·85
Demers & Lorange, St. Hyacinthe	23684	11·80	9·48	1·40	0·60	0·24	0·91	5·70	1·00	6·10	0·12	74·42	48·35
Peter Glavey, Ottawa	25008	12·71	9·96	0·60	0·46	0·08	1·50	5·24	2·68	7·47	0·67	71.34	41·23
H. O. Richer, "	25009	12·60	7·84	0·58	0·35	1·21	3·79	3·35	3·72	9.25	0 67	69·04	28·33
A Janatta & Co., Toronto	25033	7·18	10·92	0·64	0·41	1·87	0·00	3·16	3·84	1·02	0·64	74·50	44·01
F. H. Blain, Hamilton	25036	6·78	9·88	0·36	0·35	0·35	0·94	2·52	2·28	4·26	0·48	78·58	37·17
T. G. Vidian, Goderich	22205	11·25	11·08	0·14	0·31	0·74	2·98	4·63	4·16	6·62	0·38	68·96	41·16
Metcalfe & Mitchell, Brandon, Manitoba	23924	11·49	10·26	0·32	1·43	0·38	2·03	3·36	0·00	8·13	0·42	73·67	29·24
M. R. Shurman, Virden, Man.	23928	11·01	10·32	0·80	0·39	0·06	0·19	3·36	1·32	7·65	0·36	75·55	30·52

APPENDIX M.

BULLETIN No. 99—TEA.

OTTAWA, July 27, 1904.

W. J. GERALD, Esq.,
Deputy Minister of Inland Revenue.

SIR,—I submit herewith a report by Mr. McGill concerning seventy-three samples of tea collected in April and May last, in accordance with your instructions of January 14, 1904. The report is accompanied by a tabulated statement showing the origin of the various samples as well as the result of the examinations.

I have the honour to be, sir,
Your obedient servant,

THOMAS MACFARLANE.
Chief Analyst.

LABORATORY OF THE INLAND REVENUE DEPARTMENT,
OTTAWA, May 23, 1904.

THOS. MACFARLANE, Esq., F.R.S.C.,
Chief Analyst.

SIR,—I beg to hand you herewith a report upon seventy-three samples of tea, including as follows :

Black teas	50	samples.
Green and Japan	23	"
	73	

You will observe that two samples included in the Inspector's invoices have not come to hand. These are Nos. 20470 and 20471.

These samples, without exception, possess the botanical characters of the tea leaf; and the extractive is high enough to give proof that they have not undergone any exhaustion with water. The ash is normal, and they must therefore be recognized as genuine teas.

Except so far as the size of the leaf, its broken character, the presence of excess of stems and tea dust are concerned, I have done nothing to determine the quality or grade of the teas in question. The object of this examination has simply been to ascertain the specific genuineness of the samples as tea.

I have the honour to be, sir,
Your obedient servant,

A. McGILL.

INSPECTION OF TEA—Tabulated Statement.

Date.	Nature of Sample.	Number of Sample.	Name and Address of Vendor.	Cost.	Name and Address of Manufacturer or Furnisher as given by Vendor.	Result of Analysis. Specific gravity of 10 p.c. extract.	Result of Analysis. Total Ash.	Botanical Examination	Observations.	Number of Sample.
1904.	*District of Nova Scotia.*			Lb. Cts.		p. c.	p. c.			
April 12	Tea, bulk.	20445	J. W. Hebb, Bridgewater, N.S.	1 20	Bauld Bros., Halifax	1·0115	5·58	Tea leaves, large, broken	Genuine	20445
" 12	" Red Rose brand	20447	H. C. Barnaby & Sons, Bridgewater.	1 30	T. H. Esterbrooke, St., John, N.B.	1·0107	5·66	Tea leaves, broken	"	20447
" 15	" bulk.	20455	S. L. Cross, Kentville, N.S.	1 30	Baird & Peters, St. John, N.B.	1·0117	5·54	Tea leaves, much broken	"	20455
" 15	" Universal Blend	20456	W. Smith, Kentville, N.S	1 40	Daniels & Wise, London, Eng.	1·0122	5·32	Tea leaves, broken	"	20456
" 15	" Jerusalem Blend	20464	W. T. Stephens, Wolfville, N.S.	1 40	J. W. Gorham, Halifax, N.S.	1·0105	5·28	Tea leaves, large and many stems.	"	20464
" 15	" Imperial Blend	20466	H. Wentzell & Co., Halifax, N.S.	1 20	Burbridge, Pritchard & Bartlett, London, Eng.	1·0105	5·66	Tea leaves, large, much broken,	"	20466
" 15	" Halifax Blend	20470	F. P. Campbell & Co., Halifax, N.S.	1 30	Unknown			Sample not received.	"	20470
" 15	" bulk.	20471	Craig & Hudson, Halifax	1 25	John Tobin & Co., Halifax, N.S.				"	20471
	District of Prince Edward Island.									
April 28		24410	Stewart & Son, Charlottetown, P.E.I.	1 25	Blended by themselves	1·0121	5·16	Tea leaves, medium size, much broken, stems.	Genuine	24410
May 3		34416	Sinclair & Stewart, Summerside, P.E.I.		Burbridge, Pritchard & Bartlett, London, Eng.	1·0119	4·76	Tea leaves, medium	"	24416
	District of New Brunswick.			Pkgs.						
April 7	Black tea, Vim	23824	Baird & Peters, 21 South Wharf, St, John.	3 75	Blended and packed by vendors.	1·0121	5·24	Tea leaves, large and broken.	Genuine	23824
" 7	" Red Rose brand.	23825	Charles F. Francis & Co., 141 Charlotte St., St. John.	1 40 Lb.	Blended and packed by T. H. Esterbrooke, St. John	1·0132	4·96	Tea leaves	"	23825

"	13	" Nectar.....	23829	Inches & Grimmer, Water St., St. Stephen, N.B.	1 Tins.	40	Purvis & Graham St. Stephen, N.B.	1·0122	4·84	Tea leaves, with much dust.	"	...	23829
"	15	Black China tea	23832	T. M. Richards, Edmundston, N.B.	3 Lb.	30	Imported through C. H. Clarke, St. Stephen, N.B.	1·0099	5·56	Tea leaves, broken, many stems.	"	....	23832
"	19	Black tea, Rose Blend...	23837	W. R. Logan, Fredericton, N.B.	1	35	J. J. McGaffigan, St. John, N.B.	1·0129	5·64	Tea leaves, much broken and much dust.	"	....	23837
"	28	" Special Blend	23851	McKenzie & Flett, Campbellton, N.B.			" "	1·0122	5·22	Tea leaves, broken ..	"	.	23851
		District of Quebec.											
"	6	.....	24618	J. E. Bourbieux, Tingwick, Que,	1	35	L. Chaput Fils et Cie, Montreal.	1·0126	6·26	Tea leaves, large ...	Genuine	....	24618
"	7	Japan green tea...	24619	Louis Belisle, Racine.	1	35	Hudon & Orsale, Montreal.	1·0135	6·04	Tea leaves, large, much broken.	"	...	24619
"	8	Stroud's tea	24620	A. Oliver, Cowansville, ...	1	40	W. D. Stroud & Son, Montreal.	1·0142	4·64	Tea leaves, fairly large, much broken.	"	....	24620
"	8	Red Rose brand tea....	24621	S. L. Guillet, Dunham...	1	40	T. H. Esterbrooke, St. John, N.B.	1·0117	4·88	Tea leaves, large, broken	"	...	24621
"	8	Quakers' brand green tea	24622	Ormstead & Boright, Sutton, Que.	1	25	J. Matheson & Co., Montreal.	1·0130	4·88	Tea leaves, much broken	"	..	24622
"	11	Salada tea, Black Ceylon	24623	A. DesJardins, St. Théresa, Terrebonne.	1	25	Laporte, Martin et Cie, Montreal.	1·0111	5·30	Tea leaves, large, broken	.	...	24623
"	11	Japan tea	24624	W. Sauvé, St. Scholastique .	1	40	Hudon, Hebert et Cie, Montreal.	1·0140	6·04	Tea leaves, large .	"	...	24624
"	11	Ceylon green tea	24625	A. M. White, Grenville .	1	25	Cassils, Montreal ..	1·0127	6·04	Tea leaves, large, broken	"	...	24625
"	12	"	24626	G. J. Macintosh, Calumet .	1	25	W. D. Stroud & Son, Montreal.	1·0119	6·60	Tea leaves, large, much broken.	"	..	24626
"	13	Salada green tea	24627	F. A. Thompson et Cie, Buckingham.	1	25	Carter, Galbraith & Co., Montreal.	1·0124	4·86	Tea leaves, large, much broken.	"	...	24627
"	13	Black tea, Owl Chop brand.	24628	J. P. Lahaie, Buckingham .	1	25	L. Chaput fils et Cie, Montreal.	1·0125	5·36	Tea leaves, much broken and tea dust.	"	.	24628
"	14	Green Japan tea..	24629	H. P. Charron, Hull.	1	30	....	1·0124	6·94	Tea leaves and stems, large, broken.	"	....	24629
"	14	Green Japan Chester tea	24630	P. Daoust et Cie, Hull. ..	1	35	W. R. Stroud & Son, Montreal.	1·0134	6·16	Tea leaves, large	"	....	24630
1904		*District of Montreal.*											
April	4	Black tea.	25101	V. Geoffrion, 1249 Ontario St.	1	30	Not given	1·0095	5·20	Tea leaves, large, broken.	Genuine	..	25101
"	4	"	25102	L. Allaire, 1008 Ontario St .	1	20	"	1·0113	5·36	Tea leaves, large, broken.	"	...	25102
"	4	"	25103	A. Dubuc, 948 Ontario St . .	1	25	Salada Tea Co.....	1·0111	5·46	Tea leaves, large, broken.	"	....	25103
"	4	"	25104	T. Montpotis, 2587 Notre Dame.	1	25	Not given..	1·0117	5·00	Tea leaves, broken ..	"	...	25104
"	1	Japan tea	25105	" "	1	25	"	1·0107	6·46	Tea leaves, large, broken.	"	.	25105

INSPECTION OF TEA—Tabulated Statement —*Continued.*

Date of Collection.	Nature of Sample.	Number of Sample.	Name and Address of Vendor.	Cost.	Name and Address of Manufacturer or Furnisher as given by Vendor.	Result of Analysis.		Botanical Examination	Observations.	Number of Sample.
						Specific gravity of 10 p.c. extract.	Total ash.			
1904	*District of Montreal* Concluded.			Lb. Cts.		p.c.	p.c.			
April 4	Japan tea	25106	N. Chatrand, 340 Seigneurs St.	1 25	Not given	1·0105	6·90	Tea leaves, large, broken & many stems.	Genuine	25106
" 4	Black tea, Red Rose brand.	25107	" "	1 25	"	1·0113	5·24	Tea leaves, large & broken.	"	25107
" 5	Black tea.	25108	C. Campbell, 46 Cuthbert St.	1 25	Liptons	1·0127	5·30	Tea leaves, large, much broken.	"	25108
" 5	Green tea.	25109	J. C. A. Gratton, 870 St. Lawrence.	1 34	Not known	1·0107	5·96	Tea leaves, large, whole	"	25109
" 5	Black tea	25110	P. P. Boileau, 635 St. Dominique St.	1 40	Not given	1·0122	5·20	Tea leaves, large, broken.	"	25110
" 5	Black tea, Tokao brand.	25111	W. Gratton, 345 St. Hypolite St.	1 30		1·0106	5·36	Tea leaves, large, broken.	"	25111
" 5	Black tea, Blue Ribbon brand.	25112	J. Buissiere, 771 Cadieux St.	1 25		1·0115	5·40	Tea leaves, very large, broken.	"	25112
	District of Kingston.									
" 26	Black tea	25160	W. J. Bovaird, King St., Prescott, Ont.	1 35	Not given	1·0140	5·36	Tea leaves, large, broken.	Genuine	25160
" 26	Japan tea	25161	C. Whitney, King St., Prescott.	1 30	"	1·0125	6·24	Tea leaves, large	"	25161
" 27	Black tea, Red Rose brand.	25162	E. L. B. Cornell, Kemptville.	1 25	"	1·0136	4·84	Tea leaves, large, broken.	"	25162
" 27	Black tea	25163	Larose & Co., Sussex St., Ottawa.	1 15	"	1·0117	5·30	Tea leaves large, much broken.	"	25163
" 27	Green tea.	25164	" "	1 20	"	1·0115	5·94	Tea leaves very large, broken.	"	25164
" 28	Black tea, Salada..	25165	Mrs. S. Lacasse, Perth St., Brockville.	1 25	Salada Tea Co	1·0136	5·56	Tea leaves, large	"	25165

"	28	Green tea	25166	W. M. Veitch, Perth St., Brockville.	1	35	"	1·0129	6·06	Tea eaves, large	"		25166
		District of Toronto.											
"	12	Black tea	25182	J. A. Johnson, 775 Yonge St., Toronto.	1	25		1·0125	5·10	Tea leaves, large, broken.	"		25182
"	12	Japan tea	25183	W. Armstrong, 852 Yonge St., Toronto.	1	25		1·0127	6·46	Tea leaves, largh, much broken.	"		25183
"	12	Black tea	25184	Frank Giles, 822 Yonge St., Toronto.	1	30		1·0117	5 80	Tea leaves & stems	"		25184
"	12	Green tea	25185	Watson Bros., 756 Yonge St., Toronto.	1	30		1·0117	6 54	Tea leaves, much broken.	"		25185
"	12	Black tea	25186	David Bell, 702 Yonge St., Toronto.	1	35	Blended by Vendor	1·0122	5·24	Tea leaves & very many stems.	"		25186
"	12	"	25187	G. J. Melhuish, 601 Yonge St., Toronto.	1	40		1·0125	5·36	Tea leaves, broken	"		25187
"	14	Black tea	25188	J. B. Taylor, Welland, Ont.	1	40		1·0119	5·16	Tea leaves, large, broken & many stems.	"		25188
"	14	Japan tea	25189	Geo. Stalker, Welland, Ont.	1	25		1·0138	5 70	Tea leaves, large, broken.	"		25189
		District of London.											
"	6	Indian tea	22212	Beck & Schell, Berlin	1	30	Not known	1·0121	5·64	Tea leaves, medium size, broken.	Genuine		22212
"	6	Blue Ribbon tea, green	22214	Edward Flaherty, Stratford, Ont.	½	20	G. F. J. Gault, Toronto	1 0124	1·70	Tea leaves, medium, broken.	"		22214
"	7	Ceylon tea	22216	Peter Dill, Seaforth	½	20	Thos. Lipton, London, Eng.	1·0116	5·36	Tea leaves, broken	"		22216
"	7	Japan tea	22217	John Beattie & Co., Seaforth.	½	14	Elliott Mar & Co., London.	1·0129	6·22	" "	"		22217
"	8	Salada tea	22221	George Lamotte, Strathroy	½	15	A. M. Smith & Co., London, Ont.	1·0129	4·62	Tea leaves and dust	"		22221
"	9	Red Rose Ceylon tea	22223	James Fraser, Sarnia, Ont	½	20	T. H. Esterbrooke, St. John, N.B.	1·0129	5 04	"	"		22223
"	12	Grand Mogul Ceylon tea	22227	Fred Dulton, Ingersoll	½	20	T. B. Escott & Co., London, Ont.	1 0130	5·00	Tea leaves, large, broken.	"		22227
		District of Winnipeg.											
"	20	Tea	23935	Gustafson & Co., Winnipeg	1	25		1·0150	5 80	Tea leaves, large and stems.	Genuine		23935
"	20	"	23937	Prentice & Young, Winnipeg.	1	25		1·0132	5·58	" "	"		23937
"	20	"	23939	J. O. Hare, Winnipeg	1	25		1·0132	4·96	Tea leaves, large	"		23939
"	20	"	23942	S. Elliott, Winnipeg	1	25		1 0132	5·56	Tea leaves, large, broken and stems.	"		23942
		District of Calgary.											
"	20	Tea	21783	L. B. Cochran, Calgary	1	50	Codville & Co., Winnipeg.	1·0117	5·82	Tea leaves, large	Genuine		21783

INSPECTION OF TEA—Tabulated Statement—*Concluded.*

Date of Collection.	Nature of Sample.	Number of Sample.	Name and Address of Vendor.	Cost.	Name and Address of Manufacturer or Furnisher as given by Vendor.	Result of Analysis.		Botanical Examination	Observations.	Number of Sample.
						Specific gravity of 10 p.c. extract.	Total ash.			
1904.	*District of Calgary* Con.			Lb. Cts.		p.c.	p.c.			
April 20	Tea	21785	J. Kennedy & Co., Calgary	1 50	Codville & Co., Winnipeg.	1·0113	5·22	Tea leaves, small, some dust.	Genuine	21785
	Dtstrict of British Columbia.									
" 13	Tea	24936	Blair & Hadden, Cloverdale, B.C.	1 35	T. S. Annandale, New Westminster.	1·0115	5·56	Tea leaves, large, broken and many stems.	"	24936
" 21	"	24945	Phil. Oven Settlers' Store, South Vancouver.	1 40	W. J. McMillan & Co., Vancouver.	1·0121	5·40	Tea leaves, large	"	24945
" 21	"	24946	A. E. Buchanan, Central Park, W. Vancouver	1 35	Baker, Luson & Co., Vancouver.	1·0121	5·46	Tea leaves, large, broken.	"	24946
" 22	"	24947	D. Woodward, Sapperton, B.C.	1 35	T. S. Annandale, New Westminster.	1·0115	5·84	Tea leaven, large, broken and many stems.	"	24947
" 22	"	24949	Barnett Saw-mill Store	1 25	Unknown	1·0109	6·06	Tea leaves, large and broked.	"	24949
" 22	"	24953	C. Boardman, Vancouver	½ 40	"	1·0109	5·46	Tea leaves, large, broken and stems.	"	24953

APPENDIX N.

BULLETIN No. 100—GROUND COFFEE.

OTTAWA, August 3, 1904.

W. J. GERALD, Esq.,
Deputy Minister of Inland Revenue.

SIR,—I submit herewith a tabulated statement showing the results obtained by Mr. A. McGill, M.A., &c., in examining 75 samples of ground coffee, the collection of which was authorized in your letter of 14th January last. In which collection districts these samples were obtained, and the numbers of them found genuine or otherwise will be seen from the following statement:—

Collection District.	Genuine.	Adulterated.	Doubtful.	Adulteration declared.	Total.
Halifax	3	4	0	0	8
Prince Edward Island	1	0	1	0	2
New Brunswick	5	0	1	0	6
Quebec	10	0	3	0	13
Montreal	6	4	1	1	12
Kingston	5	2	0	0	7
Toronto	3	2	2	1	8
London	6	1	0	0	7
Winnipeg	3	1	0	0	4
Calgary	2	0	0	0	2
British Columbia	1	5	0	0	6
	45	19	8	3	75

I have the honour to be, sir,
Your obedient servant.

THOMAS MACFARLANE,
Chief Analyst.

Date of Collection.	Nature of Sample.	Number of Sample.	Name and Address of Vendor.	Cost.	
				Quantity.	Price.
1904.	*Halifax District.*			Lbs.	$ cts.
Jan. 27..	Coffee..	20421	D. Wood, Windsor..	1	0 30
" 27..	"	20425	Murphy & DeMont, Windsor, N.S.	..	.. ..
" 27..	"Peerless Brand".....	20433	Brown & Graham, Halifax, N.S..	.	...
" 27..	Royal Java.....	20435	R. T. Forristall, Halifax, N.S....		0 40
" 27..	"Seal"..	20436	R. Urquhart & Son, Halifax..... .. .		0 40
" 27..	....	20437	W. J. Hopgood, Halifax.		35
27..	. .. .	20441	Burgess & Quinn, Halifax, N.S...	.....	0 35
" 27..	"Peerless".....	20443	H. W. Wentzell & Co., Halifax, N.S.	....	....
	Prince Edward Island District.				
Jan. 26..	Coffee.....	24403	Geo. Packham, Charlottetown....	1	0 32
" 27..	"	24404	Brace & McKay, Summerside....		0 40
	New Brunswick District.				
" 25..	Ground coffee	23809	Maritime Spice & Coffee, Ltd., St. John.	3 half lb. tins.	0 60
" 25..	"	23810	James Moulson, 53 Sydney St., St. John.	3 half lbs. bulk	0 60
" 28..	Cowan's Famous Blend.....	23815	Gross & Dawson, Main St., Moncton.	1 lb.	0 35
" 28..	Standard and Imperial Blend... ...	23816	T. & F. Dobson, Main St., Moncton.	1	0 40
Feb. 4..	"Java" in bulk	23819	Inches & Grimmer, Water St., St. Stephen.	.....	.....
" 5..	Ground coffee	23822	Halt, Morrison & Co., Ltd., cor. Queen and York St., Fredericton.	.....	36
	Quebec District.				
Jan. 25..	Pure Mocha	23650	Maison Labonté, Terrebonne.....	1	0 35
" 26.	Coffee.....	23652	J. G. Chevalier, Joliette.	1	0 40
" 26..	"	23654	J. J. Soumis, Joliette.	1	0 40
" 27..	Java coffee.....	23657	J. O. Daviault, Berthierville. ...	1	0 40
" 28..	Coffee..	23662	Thos. Bournival, Trois Rivières..	1	0 40
" 28..	"Ubero"..	23666	L. A. Ricard, Trois Rivières.	1	0 40
" 29..	Coffee..... . . .	23669	L. Gingras, 304 Richelieu St., Que.	.....	0 40
" 29..	"	23671	S. Hamel, 106 D'Aiguillon St.....	.....	0 40
" 30..	"	23674	Mrs. F. Coveny, 2 St. Patrick St., Que.	.....	0 35
" 30..	"	23676	H. G. Kell, 80 St. Augustine... .	.....	0 35

SESSIONAL PAPER No. 14

COFFEE—Tabulated Statement.

Microscopic Examination.	Results of Analysis. Sp. Gravity of 10 extract.	Results of Analysis. Iodine reaction for Starch.	Observations.
Coffee and roasted cereals...	1·0113	Blue	Adulterated.
" tissues only	1·0083	None.	Genuine.
" and roasted cereals..	1 0126	Blue	Adulterated.
" tissues only	1·0083	None.	Genuine.
" "	1·0085	"	"
" and chicory tissues	1·0099		Contains a small quantity of chicory ; about 5 p.c. Sold as containing 2 oz. chicory per lb.
" and roasted cereals..	1 0149	Blue	Adulterated.
" "	1 0130	"	
Coffee tissues ; a little chicory.	1·0115	None.	Contains about 5 p.c. of chicory.
Coffee tissues only	1·0080	"	Genuine.
Coffee tissues only	1 0093	None	Genuine.
" "	1 0089	"	
" tissues with a trace of chicory	1·0093		Contains a trace of chicory less than 5 p.c.
" tissues only	1 0091	"	Genuine.
" "	1·0089	"	
" "	1 0087	"	
Coffee tissues only	1 0093	None	
" "	1·0091	"	"
" "	1·0081	"	"
" "	1 0087	"	"
" "	1·0091	"	"
" "	1 0088	"	"
" "	1 0084	"	"
" "	1 0090	"	"
" "	1·0081	"	"
" and chicory tissues...	1·0103	"	Contains about 5 p.c. of chicory

Date of Collection.	Nature of Sample.	Number of Sample.	Name and Address of Vendor.	Cost. Quality.	Cost. Price.
1904.	*Quebec District*— Concluded.			Lb.	S cts.
Feb. 4..	Java Coffee	23681	John Maison, Drummondville....	... .	0 40
" 4..	"	23682	T. A. Bourgault, Drummondville.		0 40
" 5.	"	23686	Prosper Dussault, St. Hyacinthe..		0 40
	Montreal District.				
Jan. 20..	Coffee	21485	A. Fournier, 1789 St. Catherine street.	1	0 40
" 20..	"	21486	C. E. Authier, 1758 St. Catherine street.	1	0 40
" 20..	"	21487	A. Mercier, 498 Dorchester street.	1	0 40
" 20..	"	21488	L. G. Thouin, 487 Lagauchetiere street.	1	0 40
" 21..	"	21489	M. F. Lafortune, 116 St. Maurice street.	1	0 40
" 21..	"	21490	Pilon & Meilleur, 114 St. Maurice street.	1	0 30
" 21..	"	21491	A. Lamy, 2021 Notre Dame street.	1	0 25
" 21..	"	21492	A. Lamy, 2021 Notre Dame street.	1	0 30
" 21..	"	21493	J. Deneau, 53 Juror st..... ..	1	0 40
" 22..	"	21494	A. Massicotte & Co., 1472 St. Catherine street.	1	0 25
" 22.	"	21495	T. Bergeron, 1522 St. Catherine street.	1	0 35
" 22..	"	21496	C. Coderre, 1358 Notre Dame street.	1	0 40
	Kingston District.				
" 28..	Coffee	25001	Peter Glavey, 37 York street, Ottawa.	1	0 35
" 28..	"	25002	H. O. Richer, 31 York street, Ottawa.	1	0 35
" 28..	"	25003	P. L. Foisy, 297 Dalhousie, street, Ottawa.	1	0 40
" 28..	"	25004	Wm. Rhodes, King st., Brockville.	1	0 40
" 28 .	"	25005	Tompkins & Co., Brockville.....	1	0 35
Feb. 1..	"	25006	Jas. Redden, Princess st., Kingston.	1	0 40
" 1..	"	25007	W. R. McRae Bros., Kingston....	1	0 30
	Toronto District.				
" 2..	Coffee.....	25022	J. Bond, 559 Queen W., Toronto..	1	0 40
" 2..	"	25023	C. Janatta & Co., 400 Queen W., Toronto.	1	0 25
" 2..	"	25024	C. Janatta & Co., 400 Queen W., Toronto.	1	0 35
" 2..	"	25025	J. Summer, 306 Queen W., Toronto.	1	0 40

SESSIONAL PAPER No. 14

COFFEE—Tabulated Statement—*Continued*.

Result of Analysis.			Observations.
Microscopic Examination.	Sp. Gravity of 10 extract.	Iodine reaction.	
Coffee tissues only	1·0087	None	Genuine.
" and chicory tissues	1·0105	"	Contains about 5 p.c. of chicory.
" "	1 0125	"	Contains about 10 p.c. of chicory.
" tissues only	1 0087	None	Genuine.
" "	1 0090	"	"
Coffee and a trace of roasted cereals	1 0083	Faint blue	Doubtful.
Coffee tissues and roasted grain	1·0130	Blue	Adulterated.
Coffee and chicory tissues	1·0149	None	Adulterated with chicory, about 15 to 20 per cent.
Coffee and cereals	1·0079	Blue	Contains roasted grain.
Coffee and chicory tissues	1 0153	None	Adulterated with chicory, about 20 per cent.
Coffee tissues only	1 0089	"	Genuine.
"	1·0088	"	"
Coffee and chicory tissues	1·0120	"	Sold as containing chicory. Contains about 10 per cent.
Coffee tissues only	1·0088	"	Genuine.
"	1·0080	"	"
Coffee and chicory tissues	1·0124	"	Adulterated with chicory, about 10 to 15 per cent.
Coffee tissues only	1·0089	"	Genuine.
"	1·0085	"	"
"	1·0076	"	"
"	1·0090	"	"
"	1·0083	"	"
Coffee and chicory tissues	1·0128	"	Contains about 10 to 15 per cent chicory.
Coffee and chicory tissues	1·0115	None	Sold as containing a small amount of chicory. Contains about 10 per cent.
Coffee, chicory and roasted cereals	1·0195	Blue	Adulterated.
Coffee and chicory tissues	1·0105	None	Contains a little chicory, about 5 per cent.
Coffee, with a little chicory	1·0117	"	Adulterated with 5 to 10 per cent chicory.

INSPECTION OF GROUND

Date of Collection.	Nature of Sample.	Number of Sample.	Name and Address of Vendor.	Cost. Quantity.	Cost. Price.
1904.	*Toronto District*— Concluded.			Lbs.	Cts.
Jan. 3..	Coffee..	25026	D. Sutherland, 295 King E., Hamilton.	1	0 40
" 3..	"	25027	C. Lee, 101 King E., Hamilton...	1	0 25
" 3..	"	25028	J. H. Horning, 92 John street, Hamilton.	1	0 25
" 3..	"	25029	F. H. Blain, 87 John st., Hamilton.	1	0 35
	London District.				
" 23..	Aroma coffee..	22187	Charles Andrews, Seaforth.....	1	0 40
" 27..	Mocha coffee.....	22189	Joseph Baxter, Stratford....	1	0 40
" 28..	Coffee	22191	Beck & Schell, Berlin.....	1	0 15
" 28.	"	22193	A. J. Fitzsimmons, Guelph.....	1	0 15
" 29..	"	22200	James Patterson & Co., Fergus, Ont.	1	0 28
Feb. 6..	"	22201	Peter Dill, Seaforth.....	1	0 40
" 6..	"	22204	Charles A. Nairn, Goderich.....	1	0 40
	Winnipeg District.				
" 9..	Coffee	23923	W. Dowling & Co., Brandon.	¼	0 25
" 10..	"	23926	A. Grant, Brandon.....	¼	0 25
" 10..	"	23927	McLellan & English, Virden... .	¾	0 35
" 12 .	"	23931	W. W. Stone, Winnipeg.....	¾	0 30
	Calgary District.				
" 10..	Ground coffee	21779	A. H. Richards & Co., Strathcona.	1	0 35
" 11.	"	21781	Monroe & Whitcomb, Edmonton.	1	0 25
	British Columbia District.				
" 2..	Coffee	24918	H. Duff, Vancouver.....	1	0 25
" 2..	"	24919	E. Clayton, Vancouver.....	1	0 25
" 2..	"	24920	W. Seidelman, Vancouver.....	1	0 25
" 2..	"	24924	McCulloch Bros., Vancouver.....	1	0 25
" 2..	"	24929	A. DesBrisay, Vancouver.....	1	0 25
" 2..	, ...	24935	C. M. Tanner, Vancouver.....	1	0 20

COFFEE—Tabulated Statement—*Concluded.*

Results of Analysis.			Observations.
Microscopic Examination.	Sp. Gravity of 10% extract.	Iodine reaction for Starch.	
Coffee tissues only	1·0097	None	Genuine.
Coffee and chicory tissues	1·0109	"	Contains about 5 per cent of chicory.
Coffee tissues only	1·0090	"	Genuine.
"	1·0082	"	"
Coffee tissues only	1·0089	"	Genuine.
"	1·0089	"	"
"	1·0089	"	"
"	1·0084	"	"
Coffee, chicory and roasted grains	1·0229	Blue	Adulterated.
Coffee tissues only	1·0091	None	Genuine.
"	1·0091	"	"
Coffee tissues only	1·0090	None	Genuine.
Coffee and chicory tissues	1·0140	"	Adulterated with chicory, about 15 to 20 per cent.
Coffee tissues only	1·0095	"	Genuine.
"	1·0096	"	"
			Is a whole coffee.
Coffee tissues only	1 0087	None	Genuine.
Coffee tissues and roasted cereals	1·0123	Blue	Adulterated.
" "	1·0117	"	"
Coffee, chicory and roasted cereals	1·0181	"	"
Coffee and roasted grain	1·0123	"	"
" "	1·0125	"	"
Coffee tissues only	1·0091	None	Genuine.